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CONTENTS

	Page
Patent and Trademark Notices	
Patent Cooperation Treaty (PCT) Information	990 OG 184
National Inventors' Day	990 OG 184
Availability of Concordance—Fourth Edition	990 OG 184
Patent and Trademark Office Services	990 OG 184
Registration to Practice	990 OG 185
Patent Suits	990 OG 186
Reissue Applications Filed	990 OG 189
Patent Notices	
Certificates of Correction for the Week of Jan. 29, 1980	990 OG 190
Disclaimers	990 OG 190
National Technical Information Service	990 OG 190
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	990 OG 191
Condition of Patent Applications	990 OG 192
Reissue Patents Granted (30,198)	1499
Plant Patents Granted (4,497)	1501
Patents Granted	
General and Mechanical (4,185,327)	1503
Chemical (4,185,957)	1717
Electrical (4,186,272)	1803
Design Patents Granted (254,036)	1861
Index of Patentees	PI 1
Indices of Reissues, Plants and Designs	PI 39
Classification of	
Patents (Including Reissues)	PI 41
Designs and Plants	PI 43
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 44
Designs and Plants	PI 45
Change of Address Form and Subscription Order Form	Back Page

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT, including the amounts of the fees thereunder and the States that may be designated in international applications, consult the notice entitled "Update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 3, 1979.

Effective August 1, 1979 the international fees are increased to the following amounts:

Basic fee under PCT Rule 15.1(i) for an international application containing 30 sheets or less	$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 30 sheets	3.50
Designation fee under PCT Rule 15.1(ii)	45.00

LUTRELLE F. PARKER,
July 3, 1979. *Acting Commissioner of Patents and Trademarks.*

National Inventors' Day

The Patent and Trademark Office, along with the National Council of Patent Law Associations, will co-sponsor National Inventors Day in the Public Search Room on Saturday, February 9, 1980 from 1:00 p.m. to 5:00 p.m. and Sunday, February 10, 1980 from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days and to attend the ceremony at 2:00 p.m. on Sunday, February 10, 1980, during which four inventors will be inducted into the National Inventors Hall of Fame.

In order to assemble the exhibits it will be necessary to close the Search Room on Friday, February 8, 1980 at 5:00 p.m. We would appreciate the cooperation of all users of the Search facilities by removing all personal property and items for the early closing.

LUTRELLE F. PARKER,
Nov. 27, 1979. *Acting Commissioner of Patents and Trademarks.*

Availability of Concordance—Fourth Edition

The Patent and Trademark Office announces the availability of the "Concordance—United States Patent Classification to International Patent Classification, 4th Edition" which relates the U.S. Patent Classification, as revised to April 9, 1979 (Classification Order No. 678) to the Third Edition of the IPC, 1979, as published for the World Intellectual Property Organization by Carl Heymanns, Verlag K. G., Munich.

Copies of the Concordance are for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, Stock Number 003-004-00562-9.

Patent and Trademark Office Services

The Patent and Trademark Office is making every effort to utilize its resources as effectively and efficiently as possible. However, delays in some services are being experienced. To improve services, the PTO is taking the following steps:

● Beginning with the issue of January 1, 1980, the original formal drawing which is supplied by the patent applicant and is 8½ by 14 inches (21.0 by 29.7 cm.) is being stored within the patented file in the Patent Search Division. This is a change from the earlier practice under which the drawing is stored in a separate location from the patent file wrappers. The new procedure will simplify obtaining the complete patented file. This procedure will be used for a three month trial period and then reevaluated for its effectiveness.

● Effective December 3, 1979, sale of tokens and maintenance of all token operated photocopy and microfilm reader-printer equipment throughout the Patent and Trademark Office are being performed by a private contractor, T S Info Systems, Inc. (TSI). Improved quality and timeliness of copy service to the public are anticipated.

All token sales are made between the hours of 8:30 A.M. and 5:00 P.M. at the token sales booth in the Record Room located in Building CP-4. When purchasing tokens by check, please make the check payable to "TSI" rather than "Commissioner of Patents and Trademarks." Tokens will not be sold at the cashier's window in CP2.

Effective February 1, 1980, charges for tokens to PTO customer deposit accounts will no longer be accepted.

● *Effective immediately,* no requests for new patent or trademark drawings will be accepted by the Patent and Trademark Office. New drawings will be prepared only for requests already received. All currently available drafting time and facilities are required to correct the backlog of drawings needing correction prior to issue. When this backlog has been eliminated, a notice will be issued to that effect and new drawings can again be prepared for the public.

Effective immediately, three additional special mail room boxes will be established in the PTO:

Box 4 will be used for all mail for the Office of Legislation and International Affairs.

Box 5 will be used for documents which are related to trademarks and for which *no fee* is required at the time of filing; e.g., amendments to applications and requests for extensions of time to file an opposition. For mail directed to the Trademark Trial and Appeal Board, put "Attention TTAB" on the envelope in addition to "Box 5."

Box 7 will be used for reissue applications which are involved in litigation and any subsequently filed papers for these applications.

Mail appropriately addressed will be sorted and forwarded on a more timely basis.

Applicants and other users of the PTO services can assist in improving the efficiency of office operations by doing the following:

● Use the following special PTO box numbers for forwarding particular types of mail. The boxes should be used only for the specified purpose.

Box 2—Replenishment of funds in deposit accounts.
Box 4—Mail for the Office of Legislation and International Affairs.
Box 5—"No fee" mail related to trademarks.
Box 7—Reissue applications for patents involved in litigation and any subsequently filed papers for these applications.
Box 8—All papers for the Office of the Solicitor.
Box 9—Coupon orders for U.S. patent and trademark copies.
Box 10—Orders for certified copies of patent and trademark applications.
Box PCT—Mail related to applications filed under the Patent Cooperation Treaty.

Only that material for which the special box was establishd should be enclosed.

The special box numbers have been established to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Therefore, if any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they were intended.

Envelopes should be addressed:

Box———
Commissioner of Patents and Trademarks
Washington, D.C. 20231

● Consider the fact that some PTO services are experiencing delays, and allow sufficient lead time for services requested of the Office. Where possible, urgent items which require no fee should be hand delivered to the appropriate area.

● Minimize the number of inquiries to the PTO regarding acknowledgment of receipt of applications, fee papers, orders for patent copies, etc.

● Include a self addressed return post card with newly filed applications. The serial number assigned the application will be stamped on the post card, which will constitute the means by which the application can be identified.

● Use commercial services for preparation of new patent and trademark application drawings.

● On all papers which are filed in patent and trademark applications and are being sent to an examining group, include the appropriate identifying data, such as examining group number, examiner's name, and the number of the application paper to which the response is directed. The paper should also identify the type of document being presented (e.g., response to Office action #——, amendment, etc.). The name and telephone number of the individual representing the applicant also should appear on all papers.

These steps have been devised in an effort to minimize delays in services. We solicit the help and cooperation of the public.

SIDNEY A. DIAMOND,
Jan. 4, 1980. *Commissioner of Patents and Trademarks.*

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before February 29, 1980.

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Patent Suits

Notices under 35 U.S.C. 290: Patent Act of 1952

2,802,760, Derick and Frosch, OXIDATION OF SEMICONDUCTIVE SURFACES FOR CONTROLLED DIFFUSION, filed July 2, 1976, D.C. Del. (Wilmington), Doc. 76–214,

Western Electric Company v. *Advanced Memory Systems, Inc.* Consent judgment filed Oct. 9, 1979. **Same, filed** Sept. 19, 1975, D.C. Del. (Wilmington), Doc. 75–308, *Western Electric Company* v. *Intersil, Inc.* Consent judgment filed Oct. 10, 1979.

2,802,760, Derick and Frosch, OXIDATION OF SEMICONDUCTIVE SURFACES FOR CONTROLLED DIFFUSION; **3,165,811,** Kleimack, Loar and Theuerer, PROCESS OF EPITAXIAL VAPOR DEPOSITION WITH SUBSEQUENT DIFFUSION INTO THE EPITAXIAL LAYER; **3,289,102,** Izuo Hayashi, VARIABLE FREQUENCY PHASE SHIFT OSCILLATOR UTILIZING FIELD-EFFECT TRANSISTORS, **filed** July 2, 1979, D.C., N.D. Tex. (Dallas), Doc. CA3–79–0847–G, *Western Electric Company, Incorporated* v. *Analog Devices, Inc.*

2,932,500, Harold Zinkin, BODY EXERCISING APPARATUS; **3,116,062,** same, EXERCISING APPARATUS, **filed** Feb. 22, 1971, W.D. Pa. (Pittsburgh), Doc. 71–166, *Universal Athletic Sales* v. *American Gym et al.* Judgment entered in favor of plaintiff and against defendant on Sept. 27, 1979.

3,055,904, Ciba-Geigy Chemical Corporation, NEW ISOINDOLINE DERIVATIVES, **filed** May 24, 1979, D.C.N.J. (Newark), Doc. 79–1582, *USV Laboratories* v. *Pharmadyne Laboratories, Inc.* Permanent injunction for plaintiff filed Sept. 25, 1979.

3,166,062. (See 2,932,500.)

3,136,676, Voplex Corporation, METALLIZED PLASTIC EXTRUSION PRODUCTS AND METHOD OF MAKING SAME, **filed** Sept. 26, 1979, D.C. Del. (Wilmington), Doc. 79–458, *Voplex Corporation* v. *Pantasote, Inc.*

3,165,045, Itek Corporation, DATA PROCESSING SYSTEM, **filed** Sept. 19, 1977, D.C. Mass. (Boston), Doc. CA 77–2958–C, *Itek Corporation* v. *Information International, Inc.* Plaintiff's complaint is dismissed. Judgment for defendant. Filed Sept. 27, 1979.

3,165,811. (See 2,802,760.)

3,206,722, Gustus and Potenza, TRAFFIC CONTROL SYSTEM FOR DRIVE-IN BANKS AND THE LIKE; **3,588,808,** Rolfe T. Gustus, IMPROVED TRAFFIC CONTROL SYSTEM FOR DRIVE-IN BANKS AND THE LIKE; **3,886,414,** Lach and Brier, DISPATCHING SYSTEM CIRCUIT; **3,893,097,** Lach and Brier, DISPATCHING SYSTEM CIRCUIT; **4,010,404,** Ronald Louis Lach, TRAFFIC ERROR CORRECTING CIRCUIT FOR TRAFFIC DISPATCHING SYSTEM, **filed** Sept. 27, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c4056, *Elec-Tro-Tec, Inc.* v. *Actron, Inc. and Ronald L. Lach.*

3,258,394, Shell Oil Company, DIMETHYL-1-METHYL-2-(METHYLCARBAMOYL) VINYL PHOSPHATE INSECTICIDE AND METHOD OF USE, **filed** Oct. 9, 1979, D.C., S.D. Calif. (San Diego), Doc. 79–1722–E, *Shell Oil Company* v. *Jessen and Company, Inc.*

3,275,487, Jerome H. Lemelson, METHOD AND AUTOMATIC APPARATUS FOR PRODUCING PILE SURFACED PLASTIC SHEETING; **3,414,928,** same, COMBINATION SPONGE AND SCOURER, **filed** July 7, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c2442, *Jerome H. Lemelson* v. *Minnesota Mining and Manufacturing Company.* Cause dismissed without prejudice per order of Oct. 4, 1979.

3,281,824, Naxon Telesign Corp., ROTATING SWITCH APPARATUS FOR CONTROLLING TRAVELING MESSAGE SIGNS, **filed** Apr. 2, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c1289, *Naxon Telesign Corp.* v. *GTE Sylvania Inc.* Stipulation of dismissal filed Sept. 21, 1979. **Same, filed** Sept. 21, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c3949. *Naxon Telesign Corp.* v. *GTE Information Systems Inc.*

3,289,102. (See 2,802,760.)

3,350,802, General Numismatics Corp., METAL GAMING TOKENS, **filed** Aug. 7, 1979, D.C. Del. (Wilmington), Doc. 79–385, *Franklin Mint Corporation* v. *Summa Corporation.*

3,391,601, James and Carmine Santandrea, IMAGE PROJECTING SYSTEM, **filed** Aug. 23, 1979, D.C., S.D.N.Y., Doc. 79–C–4461 MJL, *Jim Sant'Andrea, Inc.* v. *News Group Publications, Inc.*

3,396,500, Jay A. Lankheet, SWIMMING POOL CONSTRUCTION, **filed** Sept. 7, 1979, D.C., W.D. Mich. (Grand Rapids), Doc. G79–533 CA6, *Polynesian Pools, Inc.* v. *GPM Industries, Inc. et al.*

3,404,658, Sommer & Maca Glass Machinery Company, CURTAIN COATING APPARATUS, **filed** Aug. 31, 1979, D.C.N.J. (Newark), Doc. C–79–2656, *Sommer and Maca Industries, Inc.* v. *Century Engineering Company, Inc.*

3,406,607, Walter P. Hill, TOOL CHANGING AND FEED CONTROL MECHANISM, **filed** Sept. 21, 1979, D.C., E.D. Mich. (Detroit), Doc. 79–73700, *Hill-Grand Corp.* v. *Fujitsu Fanuc Ltd.*

3,414,928. (See 3,275,487.)

3,416,338, Presto Lock Co. Inc., LATCHING DEVICE AND COMBINATION LOCKING MEANS, **filed** Sept. 26, 1979, D.C.N.J. (Trenton), Doc. C–79–2877, *Walter Kidde & Company, Inc.* v. *H.I.T. Industries, Ltd.*

3,451,352, Jervis B. Webb Company, CONVEYOR CARRIER WITH SELECTIVELY OPERABLE DOGS, **filed** Oct. 11, 1979, D.C., E.D. Mich. (Detroit), Doc. 79–73935, *Jervis B. Webb Company* v. *Southern Systems, Inc.*

3,498,331, Roland J. Hawes, Jr., APPARATUS FOR DISPENSING AND DELIVERING FEED ADDITIVES TO LIVESTOCK AND POULTRY; **3,670,923,** Roland J. Hawes, Jr., et al., CONTROL SYSTEM FOR MULTIPLE INGREDIENT DISPENSING APPARATUS; **3,822,056,** Roland J. Hawes, Jr. et al., METHOD AND MEANS FOR ADDING SMALL MEASURED QUANTITIES OF SELECTED MATERIALS TO A LARGE CAPACITY MATERIAL-MIXING PLANT, **filed** June 29, 1979, D.C., N.D. Tex. (Amarillo), Doc. CA–2–79–108, *Micro Chemical, Inc.* v. *Great Plains Chemical Company of Kansas.*

3,536,913, Paul E. Huchel, PANORAMIC X-RAY MACHINE FOR TAKING RADIOGRAPHS OF THE ORAL CAVITY, **filed** Sept. 19, 1979, D.C., W.D.N.Y. (Buffalo), Doc. C–79–702, *Kabushiki Kaisha Morita Seisakusho et al* v. *Paul E. Huchel.*

3,587,861, Hydro-Clear Corporation, APPARATUS AND METHOD OF FILTERING SOLIDS FROM A LIQUID EFFLUENT; **3,792,773,** same, APPARATUS AND METHOD FOR TREATING WASTE LIQUID; **3,817,378,** same, METHOD AND APPARATUS FOR FILTERING SOLIDS FROM A LIQUID EFFLUENT; **4,032,443,** Sterling Drug, Inc., REMOVAL OF GREASE AND OIL FROM PARTICULATE BED GRANULES BY BACKWASHING WITH A DETERGENT, **filed** Aug. 3, 1978, D.C., M.D. Pa. (Scranton), Doc. 78–752, *Hydro Clear Corporation* v. *Conewago Contractors, Inc.* Case dismissed without prejudice except that complaint and counterclaim dismissed with prejudice on July 27, 1979.

3,587,861, Hydro-Clear Corporation, APPARATUS AND METHOD OF FILTERING SOLIDS FROM A LIQUID EFFLUENT; **3,792,773,** same, APPARATUS AND METHOD FOR TREATING WASTE LIQUID; **3,817,378,** same, METHOD AND APPARATUS FOR FILTERING SOLIDS FROM A LIQUID EFFLUENT; **3,840,117,** same, UNDERDRAIN STRUCTURE FOR WASTE EFFLUENT FILTER AND METHOD OF USING SAME; **4,032,443,** Sterling Drug Inc., REMOVAL OF GREASE AND OIL FROM PARTICULATE BED GRANULES BY BACKWASHING WITH A DETERGENT; **Re. 28,458,** Hydro-Clear Corporation, APPARATUS AND METHOD OF FILTERING SOLIDS FROM A LIQUID EFFLUENT, **filed** July 7, 1978, D.C., M.D. Pa. (Scranton), Doc. 78–649, *Hydro Clear Corporation* v. *Remsco Associates, Inc.* Case dismissed without prejudice on Sept. 29, 1979.

3,588,808. (See 3,206,722.)

3,670,923. (See 3,498,331.)

3,783,100, A. E. Staley Manufacturing Company, NON-RETROGRADED THINNED HYDROLYZATES, **filed** Nov. 3, 1978, D.C. Del. (Wilmington), Doc. 78–469, *A. E. Staley Manufacturing Company* v. *The Hubinger Company.* Complaint and counterclaim dismissed with prejudice on Nov. 5, 1979.

3,792,773. (See 3,587,861.)

3,806,312, McMaster and Nitschke, ROLLER HEARTH FURNACE; **3,936,291,** Harold A. McMaster, GLASS SHEET TEMPERING BLASTHEAD, **filed** Sept. 14, 1979, D.C., E.D. Mich. (Flint), Doc. 79–40214, *Glasstech, Inc.* v. *Double Seal Glass Company Inc.*

3,817,378. (See 3,587,861.)

3,822,056. (See 3,498,331.)

3,823,522, Automated Building Components, Inc., HINGED CONNECTOR PLATE, **filed** June 7, 1977, D.C., M.D. Pa. (Scranton), Doc. 77–485, *Automated Building Components, Inc.* v. *Thomas Fahringer, doing business as Fahringer Distributors, and Fahringer Distributors.* Case dismissed without prejudice on Sept. 29, 1977.

3,837,426, Miguel C. Junger, SOUND ABSORBING STRUCTURAL BLOCK; **3,866,001,** same, STRUCTURAL BLOCK WITH SEPTUM; **filed** Aug. 9, 1978, D.C. Mass. (Boston), Doc. 78–2024–T, *Miguel C. Junger and The Proudfoot Company, Inc.* v. *Pascale Block Co., Inc. and Robert M. Pascale.*

3,840,117. (See 3,587,861.)

3,842,785, Huey M. Rivet, AMPHIBIOUS MARSH CRAFT, **filed** Sept. 20, 1979, D.C., E.D. La. (New Orleans), Doc. 79–3636, *Kori Corporation and Huey J. Rivet* v. *Wilco Marsh Buggys and Draglines, Inc. et al.*

3,845,907, Werner Schwarz, APPARATUS FOR COMMINUTING TRASH, **filed** Aug. 15, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c3379, *Mitts & Merrill, Inc.* v. *Shred Pax Corp. et al.*

3,845,907, Werner Schwarz, APPARATUS FOR COMMINUTING TRASH; **3,880,361,** same; **3,981,455,** Al Kaczmarek, DEVICE FOR PROCESSING REFUSE, **filed** Aug. 28, 1979, D.C., E.D. Mich. (Detroit), Doc. 79–10198, *Mitts & Merrill, Inc.* v. *Kleco Shredder Systems, Inc.*

3,860,164, Howard S. Dworkin, END CONSTRUCTION FOR BELLOWS TYPE ENVELOPES AND THE LIKE, **filed** Feb. 2, 1976, D.C., E.D. Pa. (Philadelphia), Doc. C.A. 76–305, *Howard S. Dworkin* v. *National Fiberstok Corp.* Order filed in favor of defendant on Oct. 11, 1979.

3,863,273, Robert G. Averill, ORTHOPEDIC PROSTHETIC IMPLANT DEVICES, **filed** Sept. 15, 1978, D.C. Del. (Wilmington), Doc. 78–389, *Minnesota Mining & Manufacturing Co.* v. *Medishield, Inc. et al.* Stipulation, injunction and order of dismissal without prejudice filed Oct. 10, 1979.

3,864,768, Richard Fraige, WATER MATTRESS WITH INTERNAL FLOAT TUBE, **filed** Jan. 10, 1977, D.C., N.D. Calif. (San Francisco), Doc. C–77–68 SC, *Vinyl Products Manufacturing Inc. et al.* v. *Calco-Hawaiian Import & Export Co. etc. et al.* Judgment in favor of defendants and against plaintiffs entered Oct. 21, 1977.

3,866,001. (See 3,837,426.)

3,875,832, Johnny W. Mayfield, MANUAL PIPE BEVELLING TOOL, **filed** Sept. 17, 1979, D.C., C.D. Calif. (Los Angeles), Doc. 79–03619 LTL (Kx), *Johnny W. Mayfield et al.* v. *Tri-Tool Manufacturing Inc. et al.*

3,880,361. (See 3,845,907.)

3,886,414. (See 3,206,722.)

3,893,007. (See 3,206,722.)

3,901,306, Woodward Mfg. and Sales Co., POWER CONTROL HAND TRUCK, **filed** Nov. 8, 1979, D.C., N.D. Calif. (San Francisco), Doc. C–79–3178 WTS, *Woodward Mfg. and Sales Co.* v. *Ready Lift Co.*

3,906,173, Frank R. Bradley, TELEPHONE LINE CHARACTERISTIC MEASURING INSTRUMENT AND DISPLAY, **filed** Sept. 27, 1979, D.C.N.J. (Trenton), Doc. 79–2893, *Bradley Telcom Corp.* v. *Halcyon Incorporated.*

3,915,777, Benjamin B. Kaplan, METHOD OF APPLYING FIRE-RETARDANT COATING MATERIALS TO A SUBSTRATE HAVING CORNERS OR OTHER SHARP EDGES, **filed** May 1, 1979, D.C., E.D. Mo. (St. Louis), Doc. 79–0502 (2), *Stan Chem, Inc.* v. *TSI, Inc.*

3,936,291. (See 3,806,312.)

3,946,472, J. P. Tool, Limited, BROACHING TOOL, **filed** Oct. 26, 1979, D.C., E.D. Mich. (Detroit), Doc. 79–74134, *J. P. Tool, Ltd.* v. *The Valeron Corporation et al.*

3,953,566, W. L. Gore & Associates, Inc., PROCESS FOR PRODUCING POROUS PRODUCTS, **filed** Nov. 2, 1979, D.C., N.D. Ohio (Cleveland), Doc. C–79–2074, *W. L. Gore & Associates, Inc.* v. *Garlock, Inc.*

3,954,163, Xerox Corporation, HIGH SPEED PRINTER WITH INTERMITTENT PRINT WHEEL AND CARRIAGE MOVEMENT, **filed** Oct. 5, 1979, D.C., N.D. Calif. (San Francisco), Doc. C79–2848 RHS, *Xerox Corporation* v. *Qume Corporation.*

3,959,696, Siemens Aktiengesellschaft, OVER VOLTAGE ARRESTER, **filed** Feb. 6, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c408, *Siemens Aktiengesellschaft* v. *Reliable Electric Company.* Cause dismissed with leave to reinstate on Oct. 30, 1979.

3,965,530, Bruce R. Maier, BRUSH AND CLEANING COMPOSITION FOR PHONOGRAPH RECORDS; **Reg. No. 1,017,607** (DISCWASHER), Discwasher, Inc., **filed** Oct. 4, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c3688, *Discwasher Inc.* v. *Fidelitone, Inc.* Cause is taken off the call for a status report on Jan. 26, 1977.

3,981,455. (See 3,845,907.)

3,983,869, Katumi Suzuki, HUMIDIFIER FOR AQUALUNG EQUIPMENT, **filed** Oct. 26, 1979, D.C., N.D. Calif. (San Francisco), Doc. C79–3011 WHO, *Katumi Suzuki* v. *Farallon Industries, Inc.*

4,010,404. (See 3,206,722.)

4,022,065, Ramin and Stearns, CALIBRATED SAMPLE DELIVERY APPARATUS ACCOMMODATING OFFSET ERROR, **filed** Sept. 20, 1979, D.C., S.D. Tex. (Houston), Doc. H–79–1932, *Stanley D. Stearns and James A. Ramin* v. *Beckman Instruments, Inc.*

4,032,443. (See 3,587,861.)

4,033,217, S & S Corrugated Paper Machinery Co., Inc., SLITTER HAVING CARRIER FOR SELECTIVE ADJUSTMENT OF A PLURALITY OF HEADS, **filed** June 27, 1979, D.C.N.J. (Camden), Doc. 79–1922, *S & S Corrugated Paper Machinery Co., Inc.* v. *Molins Machine Co., Inc.* Notice of dismissal filed Oct. 9, 1979.

4,082,193, LeRoy LaSalle, PIPE HANDLING APPARATUS, **filed** Sept. 21, 1979, D.C., W.D. La. (Shreveport), Doc. 79–1306, *A. C. Company of South Louisiana, Inc. et al.* v. *Al George, Inc.* **Same, filed** Sept. 21, 1979, D.C., W.D. La. (Shreveport), Doc. 79–1307, *A. C. Company of South Louisiana, Inc. et al.* v. *Frank's Casing Crews, Inc.* **Same, filed** Sept. 21, 1979, D.C., W.D. La. (Shreveport), Doc. 79–1308, *A. C. Company of South Louisiana, Inc. et al.* v. *Laydown Service, Inc.*

4,084,539, Copar Corporation, VOLTAGE TO AIR PRESSURE TRANSDUCER, **filed** Nov. 17, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c4589, *Copar Corporation* v. *Valco Cincinnati, Inc.* Cause dismissed without prejudice on Sept. 17, 1979.

4,093,232, Bally Manufacturing Corporation, PLAYER OPERATED GAME APPARATUS, **filed** June 6, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c2246, *Bally Manufacturing Corporation* v. *D. Gottlieb & Co. and Williams Electronics Inc.* **Same, filed** Feb. 23, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c713, *Bally Manufacturing Corporation* v. *Game Plan Inc and Astro Games, Inc.*

4,099,658, John A. Bott, ARTICLE CARRIER FOR AUTOMOTIVE VEHICLES, **filed** May 8, 1979, D.C., E.D. Mich. (Detroit), Doc. 79–71438, *John A. Bott* v. *Four Star Corporation.*

4,104,164, Robert G. Chelton, DEVICE FOR TREATING WASTE WATER, **filed** Sept. 26, 1979, D.C., S.D. Fla. (Miami), Doc. 79–6534–C–CA, *Mimex Environmental Systems, Inc.* v. *Robert G. Chelton.*

4,117,260, Frederic Nash Wilkenloh, COAXIAL DROP WIRE, **filed** Aug. 3, 1979, D.C., W.D.N.C. (Statesville), Doc. ST–C–79–21, *Belden Corporation* v. *Comm/Scope Company.*

4,117,644, Roger Neil Weinar, WALLBOARD FASTENER, **filed** Oct. 31, 1979, D.C., E.D. Mich. (Detroit), Doc. 79–74172, *Roger Neil Weinar* v. *Rollform Incorporated and George C. Adams.*

4,128,177, Leggett & Platt, Incorporated, DISPLAY RACK WITH IMPROVED SHELF ASSEMBLY, **filed** Feb. 20, 1979, D.C., N.D. Ga. (Atlanta), Doc. C79–285A, *Leggett & Platt, Incorporated* v. *The Mead Corporation.* Stipulation of dismissal without prejudice filed Oct. 9, 1979.

4,139,318, CMI Corporation, METHOD AND APPARATUS FOR PLANING A PAVED ROADWAY; **4,140,420,** same, PORTABLE GRADE AVERAGING APPARATUS; **D. 225,986,** same, TRIMMER-SPREADER ROAD CONSTRUCTION MACHINE OR THE LIKE, **filed** Apr. 25, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c1684, *CMI Corporation* v. *Barber-Greene Company.*

4,140,420. (See 4,139,318.)

4,146,904, Clarence Williams, DOOR HAVING IMPROVED CLOSING AND LATCHING SYSTEMS, **filed** Oct. 25, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c4468, *Clarence Williams* v. *Justrite Manufacturing Company.*

4,148,112, The American Original Corporation, HYDRAULIC EVISCERATION OF MOLLUSKS, **filed** Oct. 26, 1979, D.C., E.D. Va. (Norfolk), Doc. 79–950–N, *The American Original Corporation* v. *Jenkins Food Corp. et al.*

4,152,986, Dadowski, Mahr, and Drachman, METHOD AND APPARATUS FOR PRINTING RAISED INK IMAGES, **filed** Sept. 27, 1979, D.C., W.D. Pa. (Pittsburgh), Doc. 79–1390, *The Mazer Corporation* v. *Codo Mfg. Corp. et al.* **Same, filed**

Sept. 28, 1979, D.C., S.D. Ohio (Dayton), Doc. C-3-79-357, *Spirit Gravure Company* v. *The Mazur Corp.*

4,154,473, American Sunroof Corporation, VEHICLE ROOF STRUCTURE KIT, **filed** Aug. 8, 1979, D.C., E.D. Mich. (Detroit), Doc. 79-73213, *American Sunroof Corp.* v. *Car & Concepts, Inc.*

4,167,226, R. W. Hartnett Company, CAPSULE TURNING APPARATUS (RANDOM SPIN PRINTING), **filed** Oct. 5, 1979, D.C.N.J. (Camden), Doc. 79-3011, *R. W. Hartnett Company* v. *Edward Michael Ackley et al.*

4,169,336, CPG Products Corporation, STRETCHABLE FIGURE EXHIBITING SLOW RECOVERY, **filed** Oct. 3, 1979, D.C., S.D. Ohio (Cincinnati), Doc. C-1-79-582, *CPG Products Corporation* v. *Mego Corporation and Van Leunen's, Inc.*

Re. 28,222, Keith H. Wycoff, COMMUNICATION RECEIVER INCORPORATING TONE OPERATED PULSER CIRCUIT AND ELECTRONIC SWITCH, **filed** Sept. 20, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c3918, *Keith H. Wycoff* v. *Multitone Electric Co., Ltd.*

Re. 28,458. (See 3,587,861.)

Re. 28,808, American Cyanamid Company, POLYQUATERNARY FLOCCULANTS, **filed** Aug. 17, 1979, D.C., E.D. La. (New Orleans), Doc. 79-3207, *American Cyanamid Company* v. *Pearl River Chemical Company, Inc. et al.*

D. 225,954, Michael Schachel, COMBINED CLOTHES RACK AND STORAGE SHELF UNIT, **filed** Nov. 2, 1979, D.C., S.D. Fla. (Miami), Doc. 79-5137-C-JLK, *Michael Schachel et al.* v. *Closet Concepts et al.*

D. 225,986. (See 4,139,318.)

D. 238,846, William Finnegan, NUT DISPENSER, **filed** Mar. 16, 1978, D.C., C.D. Calif. (Los Angeles), Doc. CV78-1008 WPG, *William Finnegan* v. *Morris Struhl, Inc.*

D. 242,576, Michael H. Shulman, WRAPPER, **filed** Oct. 17, 1979, D.C., N.D. Tex. (Dallas), Doc. 3-79-1293-G, *Infra-Pak (Dallas), Inc.* v. *Mizer Packaging Systems, Inc. et al.*

D. 243,893, Trend Line Furniture Corporation, SOFA, **filed** May 1, 1979, D.C., W.D.N.C. (Statesville), Doc. ST-C-79-15, *Trend Line Furniture Corporation* v. *Stylecraft Furniture, Inc.* Judgment filed Nov. 6, 1979.

D. 245,542, Hydro-Spa, Inc., BATHING POOL, **filed** Sept. 10, 1979, D.C., N.D. Tex. (Dallas), Doc. CA3-79-1144-G, *Hydro-Spa, Inc.* v. *David Grove.*

D. 246,874, Acricite Co., Inc., HANDBAG, **filed** Mar. 15, 1978, D.C., S.D.N.Y., Doc. 78-C-1146, *Acricite Co. Inc.* v. *Colton-Lewis Inc.*

D. 247,834, Crestline Furniture Company, Inc., SOFA, **filed** Jan. 3, 1979, D.C., W.D.N.C. (Statesville), Doc. ST-C-79-1, *Hickory Hill Furniture Company, Inc.* v. *Bassett Furniture Industries of North Carolina, Inc. et al.* Defendants are permanently enjoined and restrained from infringing plaintiff's patent. Sept. 25, 1979.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,405,347, Re. S.N. 091,292, Filed Nov. 5, 1979, Cl. 322/19, BREAKERLESS FLYWHEEL MAGNETO IGNITION SYSTEM, Thomas Edwin Swift, et al., Owner of Record: *Eltra Corporation, Toledo, Ohio,* Attorney or Agent: Robert H. Johnson, Ex. Gp.: 212

3,495,668, Re. S.N. 091,758, Filed Nov. 6, 1979, Cl. 175/341, DRILL BIT, Percy W. Schumacher, Jr., Owner of Record: *G. W. Murphy Industries Inc., Houston, Tex.,* Attorney or Agent: Jack R. Springgate, Ex. Gp.: 354

3,896,150, Re. S.N. 088,124, Filed Oct. 25, 1979, Cl. 260/340.7, 2,6,10-TRIMETHYLDODECA-2,6,11-TRIEN-10-01-1-AL, 2,6-DIMETHYL-2,6-UNDECADIEN-10-ON-1-AL AND THEIR ACETALS AND PROCESSES FOR THEIR PRODUCTION, Werner Hoffmann, Owner of Record: *Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen-Rhein, Land Rheinland-Pfalz, Germany,* Attorney or Agent: Herbert B. Keil, Ex. Gp.: 121

3,936,439, Re. S.N. 088,616, Filed Oct. 26, 1979, Cl. 536/26, 2,6-DIAMINONEBULARINE DERIVATIVES, Ryuji Marumoto, et al., Owner of Record: *Takeda Chemical Industries, Ltd., Osaka, Japan,* Attorney or Agent: Harold C. Wegner, et al., Ex. Gp.: 125

4,015,133, Re. S.N. 092,359, Filed Nov. 8, 1979, Cl. 250/492 R, METHOD OF PRODUCING STRING OF POLYAMIDE AND STRINGED RACKETS AND STRINGED MUSICAL INSTRUMENTS WITH SUCH STRINGS, Harry Ferrari, Owner of Record: *Inventor,* Attorney or Agent: Hymen Diamond, Ex. Gp.: 256

4,036,887, Re. S.N. 068,990, Filed Aug. 23, 1979, Cl. 260/599, PREPARATION OF 3-BROMOBENZALDEHYDE, Roger A. Sheldon, et al., Owner of Record: *Shell Oil Company, Houston, Tex.,* Attorney or Agent: Frank R. LaFontaine, et al., Ex. Gp.: 120

4,061,819, Re. S.N. 090,036, Filed Oct. 31, 1979, Cl. 428/294, PRODUCTS OF CONVERTED LIGNOCELLULOSIC MATERIALS, Derek Barnes, Owner of Record: *McMillan Bloedel Limited, Vancouver, B.C., Canada,* Attorney or Agent: William E. Schuyler, et al., Ex. Gp.: 164

4,078,620, Re. S.N. 092,087, Filed Nov. 6, 1979, Cl. 175/48, METHOD OF AND APPARATUS FOR TELEMETERING INFORMATION FROM A POINT IN A WELL BOREHOLE TO THE EARTH'S SURFACE, John H. Westlake, et al., Owner of Record: *Inventors,* Attorney or Agent: John W. Malley, Ex. Gp.: 354

4,081,949, Re. S.N. 088,780, Filed Oct. 29, 1979, Cl. 57/268, DOFFER WITH PNEUMATIC CONTROL SYSTEM, Alex J. Keller, et al., Owner of Record: *Automatic Material Handling, Inc., Bessemer City, N.C.,* Attorney or Agent: Channing L. Richards, et al., Ex. Gp.: 244

4,086,010, Re. S.N. 087,174, Filed Oct. 22, 1979, Cl. 355/70, ILLUMINATION SYSTEM UTILIZING TWO OPPOSING DC LAMPS WITH AN OPTIMUM BARREL-SHAPED SLIT, Charles F. Gallo Jr., et al., Owner of Record: *Xerox Corporation, Stamford, Conn.,* Attorney or Agent: Harvey M. Brownrout, et al., Ex. Gp.: 212

4,088,222, Re. S.N. 058,228, Filed Jul. 16, 1979, Cl. 198/502, BELT SWITCH, Frank K. Hurt, Owner of Record: *Inventor,* Attorney or Agent: B. Franklin Griffin, Jr., et al., Ex. Gp.: 313

4,088,222, Re. S.N. 058,229, Filed Jul. 16, 1979, Cl. 198/502, BELT SWITCH, Frank K. Hurt, et al., Owner of Record: *Frank K. Hurt,* Attorney or Agent: B. Franklin Griffin, Jr., et al., Ex. Gp.: 313

4,096,148, Re. S.N. 090,722, Filed Nov. 2, 1979, Cl. 260/244.4, OXAZOLIDINEDIONE DERIVATIVES OF VINCA ALKALOIDS, Jean C. Miller, et al., Owner of Record: *Eli Lilly and Company, Indianapolis, Ind.,* Attorney or Agent: Arthur R. Whale, Ex. Gp.: 122

4,100,615, Re. S.N. 090,822, Filed Nov. 2, 1979, Cl. 366/169, FOOD PROCESSING APPARATUS, James W. Thompson, Owner of Record: *Hobart Corporation, Troy, Ohio,* Attorney or Agent: Lawrence B. Biebel, et al., Ex. Gp.: 242

4,102,204, Re. S.N. 064,557, Filed Aug. 8, 1979, Cl. 73/626, ULTRASONIC SECTION PLANE EXAMINATION AND DISPLAY, Carl Kretz, Owner of Record: *Inventor,* Attorney or Agent: Donald Gunn, et al., Ex. Gp.: 240

PATENT NOTICES

Certificates of Correction for the Week of Jan. 29, 1980

Re. 30,065	4,084,247	4,156,067	4,168,323
3,599,824	4,098,164	4,161,084	4,168,406
3,995,608	4,098,363	4,161,584	4,168,426
3,997,151	4,099,542	4,162,301	4,168,466
4,049,777	4,099,606	4,162,472	4,169,368
4,055,209	4,106,719	4,162,475	4,169,804
4,067,875	4,110,306	4,162,923	4,169,922
4,067,929	4,112,227	4,164,179	4,169,934
4,072,502	4,143,451	4,165,464	4,170,090
4,075,803	4,149,851	4,165,519	4,170,288
4,077,782	4,150,432	4,165,637	4,170,643
4,078,007	4,150,968	4,165,648	4,170,911
4,078,426	4,152,136	4,165,846	4,171,331
4,078,599	4,152,329	4,166,948	4,171,376
4,078,642	4,152,435	4,167,663	4,171,657
4,082,056	4,153,590	4,168,171	4,172,213
4,082,128	4,154,156	4,168,312	4,172,606

Disclaimers

Re. No. 26,477.—*Walter P. Baermann*, Raleigh, N.C., *Armand V. Cooke*, Bridgeport, Conn., and *Everett A. Peterson*, Mineola, N.Y. SHEATH PACKAGE. Patent dated Oct. 8, 1968. Disclaimer filed Nov. 15, 1979, by the assignee, *Marion Laboratories, Inc.*

Hereby enters this disclaimer to the entire remaining term of said patent.

3,978,619.—*Charles W. Echols, Sr.*, College Park, Ga. THERMAL BARRIER CURTAIN WALL. Patent dated Sept. 7, 1976. Disclaimer filed Mar. 26, 1979, by the assignee, *The William L. Bonnell Company, Inc.*

Hereby enters this disclaimer to claims 1, 2, 8, 9, 17, 18, 21, 22 and 23 of said patent.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

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Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator, National Technical Information Service.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Branch, General Service Division, Federal Bldg., Agricultural Research Service Hyattsville, Md. 20782

Patent 4,144,256. Antimicrobial Fatty Acid Derivatives. Filed May 10, 1978. Patented Mar. 13, 1979. Not available NTIS.

Patent 4,146,650. Substituted Benzodioxan Sweetening Compound. Filed Apr. 26, 1978. Patented Mar. 27, 1979. Not available NTIS.

Patent 4,154,862. Method of Reducing Bitterness and Off After-Taste. Filed Jan. 13, 1977. Patented May 15, 1979. Not available NTIS.

Patent 4,157,406. Process for Improving Baking Properties of Unbleached Cake Flour. Filed Feb. 15, 1977. Patented June 5, 1979. Not available NTIS.

Patent 4,159,351. Process for Preparing Mixed Bean Salads. Filed Jan. 30, 1978. Patented June 26, 1979. Not available NTIS.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent application 763,164. Tape Transport Mechanism. Filed Jan. 27, 1977.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20205

Patent application 6–058,287. (N-Phosphonacetyl-L-Aspartato) (1,2-diamino-cyclohexane) platinum (II) or Alkali Metal Salt. Filed July 17, 1979.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent application 6–051,568. Terminated Bis(3,4-Dicyanophenoxy) Alkanes and Polyphthalocyanines Therefrom. Filed June 25, 1979.

Patent application 6–051,569. Perfluorinated Aliphatic Phenoxy Bisorthodinitriles and Polyphthalocyanines Therefrom. Filed June 25, 1979.

Patent 4,157,358. Fluorinated Network Polymers. Filed Oct. 13, 1978. Patented June 5, 1979. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Branch, General Service Division Federal Bldg., Agricultural Research Service Hyattsville, Md. 20782

Patent 4,154,111. Cotton Dust Analyzer. Filed Apr. 4, 1978. Patented May 15, 1979. Not available NTIS.

Patent 4,156,742. Method of Preparing Corn Kernel Snack Food and Product Thereof. Filed May 23, 1978. Patented May 29, 1979. Not available NTIS.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent application 778,275. Magnetic Thin-Film Split-Domain Current Sensor Recorder. Filed Mar. 16, 1977.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent 4,154,168. Flare Release System. Filed Feb. 13, 1978. Patented May 15, 1979. Not available NTIS.

Patent 4,160,314. Degraining, a Three Step Process to Obtain Propellant Samples From Case Bonded Motors. Filed Apr. 28, 1978. Patented July 10, 1979. Not available NTIS.

Patent 4,160,417. Arming-Safing System for Airborne Weapons. Filed Apr. 29, 1969. Patented July 10, 1979. Not available NTIS.

Patent 4,161,716. Very Low Frequency Sonobuoy (VLF Sonobuoy). Filed Dec. 16, 1977. Patented July 17, 1979. Not available NTIS.

Patent 4,161,780. Spin Rate Timing System. Filed June 23, 1978. Patented July 17, 1979. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters—NASA
Code GP–2, Washington, D.C. 20546

Patent 4,158,583. High Performance Ammonium Nitrate Propellant. Filed Dec. 16, 1977. Patented June 19, 1979. Not available NTIS.

Patent 4,160,601. Biocontamination and Particulate Detection System. Filed Feb. 24, 1978. Patented July 10, 1979. Not available NTIS.

U.S. DEPARTMENT OF COMMERCE
National Technical Information Service, Office of Government Inventions and Patents
Springfield, Va. 22161

Patent application 6–031,706. Ultra-Black Coating Due to Surface Morphology. Filed Apr. 20, 1979.

Patent application 6–020,359. Sampling Circuit and Method Therefor. Filed Mar. 14, 1979.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20205

Patent application 969,571. Unitized Three Leaflet Heart Valve. Filed Dec. 14, 1978.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626–7555 Ext. 274
	Sacramento: California State Library	(916) 322–4572
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242–7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF DECEMBER 1, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—R. FRIEDMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-1-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines: Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-3-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR. Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Fore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	2-8-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	4-4-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-10-78
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications: Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	4-13-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	5-19-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	10-2-78
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits: Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-31-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-1-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-9-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	11-1-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	11-1-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	11-21-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-4-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners: Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	2-29-78

Expiration of patents: The patents within the range of numbers indicated below expire during December 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,066,302 to 3,070,800, inclusive
Plant Patents..... Numbers 2,198 to 2,207, inclusive

REISSUES

JANUARY 29, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

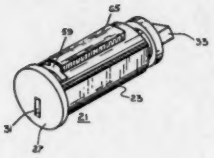
Re. 30,198
CYLINDER LOCK

Roy N. Oliver; Elvis C. Flora; Paul A. Powell, and Roy C. Spain, all of Salem, Va., assignors to Mechanical Development Co., Inc., Salem, Va.

Original No. 3,499,302, dated Mar. 10, 1970, Ser. No. 627,243, Mar. 1, 1967. Application for reissue Dec. 13, 1977, Ser. No. 843,309

Int. Cl.[2] E05B *15/14, 19/02, 27/04*

U.S. Cl. 70—364 A 14 Claims



1. In a cylinder lock operated by a proper angularly bitted key, a cylinder shell, a key plug rotationally mounted in said cylinder shell to provide a shear line between said cylinder shell and said key plug, at least one tumbler mounted in said key plug to reciprocate and rotate therein as a whole, at least one driver associated with said tumbler positioned by the reciprocal movement of said tumbler upon engagement with the proper bitted key to clear the shear line, and a fence member blockingly associated with said tumbler and shaped so that the rotational positioning of said tumbler upon engagement with the proper bitted key allows said fence to clear the shear line.

Re. 30,199
OXIDATION HAIR DYES BASED UPON TETRAAMINOPYRIMIDINE DEVELOPERS

David Rose, Dusseldorf-Holthausen; Ferdi Saygin, Erkrath, and Erwin Weinrich, Dusseldorf-Holthausen, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Fed. Rep. of Germany

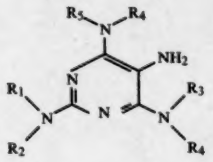
Original No. 4,003,699, dated Jan. 18, 1977, Ser. No. 526,232, Nov. 22, 1974. Application for reissue Oct. 23, 1978, Ser. No. 953,688

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1973, 2359399; Oct. 2, 1974, 2447017

Int. Cl.[2] A61K *7/13*

U.S. Cl. 8—10.2 9 Claims

1. An aqueous preparation for the dyeing of hair consisting essentially of (1) from 0.2% to 5% by weight of an oxidation dyestuff combination of a developer component, and a coupling component in substantially equimolar amounts, said developer component consisting essentially of (A) a tetraaminopyrimidine of the formula



wherein R_1, R_2, R_3, R_4, R_5 and R_6 are each selected from the group consisting of hydrogen, phenyl, 6-alkyl having 1 to 4 carbon atoms, phenylalkyl having 7 to 10 carbon atoms, phenylalkenyl having 7 to 10 carbon atoms,

$$X—(CH_2)_n—$$

wherein n is an integer from 1 to 4, and X is selected from the group consisting of hydroxyl, halogen and NR_7R_8— in which R_7 and R_8 are selected from the group consisting of hydrogen and alkyl having 1 to 4 carbon atoms, and together with the nitrogen atom R_7 to R_8 form a 5 to 6 membered heterocyclic ring optionally containing an additional nitrogen atom or an oxygen atom,

and wherein R_1 and R_2 or R_3 and R_4 or R_5 and R_6, together with the nitrogen atom form a 5 to 6 membered heterocyclic ring, optionally containing another nitrogen or oxygen atom in the ring or (B) a water-soluble acid addition salt of (A); (2) from 0% to 5% by weight of a direct dyestuff; (3) from 0% to 30% by weight of a surfactant; (4) from 0% to 25% by weight of a thickener; and (5) the balance up to 100% by weight of water.

PLANT PATENTS

GRANTED JANUARY 29, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,497

AFRICAN VIOLET PLANT

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Erfindergemeinschaft "OPTIMARA", Isselburg, Fed. Rep. of Germany

Filed Dec. 4, 1978, Ser. No. 966,224
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet plant known by the cultivar name Missouri and particularly characterized by the combined features of vigorous and compact growth habit; intensive red-violet flowers with filled edges; strong and upright flower stems; long blooming period, and an abundant flower display at first flash.

4,498

AFRICAN VIOLET PLANT

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Erfindergemeinschaft "OPTIMARA", Isselburg, Fed. Rep. of Germany

Filed Dec. 4, 1978, Ser. No. 966,226
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet known by the cultivar name Oregon and characterized by the combined features of large, non-dropping pink flowers with frilled edges, with a few flowers tending to semi-double; strong upright flower stems, and up to nine flowers per stem with the first flash of flowers, which occurs approximately eight weeks after potting.

PATENTS

GRANTED JAN. 29, 1980

ERRATA

For CLASS	See PATENT NO.
433–173	4,185,383
433–070	4,185,384
433–028	4,185,385
433–082	4,185,386
433–061	4,185,387
433–125	4,185,388
410–064	4,185,564
037–015	4,185,650
156–258	4,185,718
223–085	4,185,768
248–295 R	4,185,808
316–005	4,185,922
431–291	4,185,953
430–220	4,186,001
430–001	4,186,002
430–097	4,186,003
430–218	4,186,004
430–228	4,186,005
430–302	4,186,006
430–467	4,186,007
430–393	4,186,008
430–353	4,186,009
430–627	4,186,010
430–505	4,186,011
430–544	4,186,012
430–228	4,186,013
430–218	4,186,014
430–231	4,186,015
430–506	4,186,016
430–162	4,186,017
430–532	4,186,018
430–557	4,186,019
435–028	4,186,052
435–180	4,186,053
430–175	4,186,069
206–380	4,186,073
548–186	4,186,129
548–215	4,186,130
548–251	4,186,131
544–146	4,186,136
549–079	4,186,137

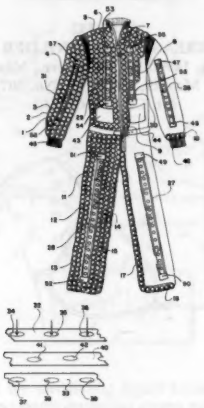
525–461 4,186,154
525–078 4,186,155
525–078 4,186,156
204–158 R 4,186,175
404–133 4,186,197
424–270 4,186,264
367–004 4,186,370
367–109 4,186,371
367–115 4,186,372
367–131 4,186,373
367–004 4,186,374
367–040 4,186,375
364–433 4,186,423

PATENTS

GRANTED JANUARY 29, 1980

GENERAL AND MECHANICAL

4,185,327
VENTILATING AND INSULATING GARMENT
Howard J. Markve, Box 344, Silverton, Id. 83867
Filed Jul. 17, 1978, Ser. No. 925,272
Int. Cl.[2] A41D *13/00*
U.S. Cl. 2—2 **5 Claims**



1. A garment, comprising

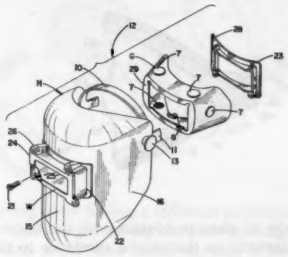
insulating material dimensioned and shaped to fit on a human body, said insulating material consisting of moldable material having a plurality of substantially spherical air pockets formed in the material;

an elongated hole formed through the insulating material; and

ventilating means movably mounted in said insulating material and manually positioned to selectively cover and uncover said hole, said ventilating means including manual means for manually moving said ventilating means to selectively cover and uncover said hole, last line, before the period has been inserted—said ventilating means comprising first and second strips affixed in the hole in substantially juxaposed position each of said first and second strips having a plurality of spaced holes formed therethrough, the holes of said first and second strips being in alignment, and a third strip slidably interposed between the first and second strips and having a plurality of sp spaced holes formed therethrough, said third strip including said manual means and being manually movable to selectively clear and block the holes of said first and second strips.

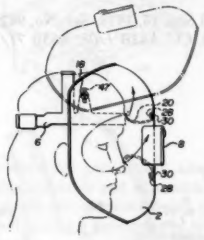
4,185,328
SIGHT AND VISION PROTECTION FOR ARC WELDING HELMET
John C. Graveno, 1114 Winston Rd., So. Euclid, Ohio
Filed Jan. 17, 1977, Ser. No. 759,621
Int. Cl.[2] A42B *1/00*
U.S. Cl. 2—8 **11 Claims**

1. The combination of an arc welder's helmet having a forwardly disposed protective window through which the welder views his work and from the welder's side of which back-light from within the helmet tends to reflect into the welder's eyes and impair his vision, and a hollow, back-light guard with opaque sides and open at both ends and disposed within the helmet between the window and the welder's face



and preventing back-light from shining on the welder's side of the window and being reflected toward the welder's eyes.

4,185,329
WELDER'S SHIELD FOR ELECTRIC ARC WELDING
Philip R. Sarazen, 446 Lisgar St., Ottawa, Ontario, Canada
Filed Oct. 3, 1977, Ser. No. 838,919
Int. Cl.[2] A61F *9/06, 9/02*
U.S. Cl. 2—8 **11 Claims**



1. A welder's shield for use with an electric arc welding system, the shield comprising a face mask having front and side wall portions for extending in front and to the sides of the face of a wearer, and viewing means in the mask to protect the eyes of the wearer against direct radiation from the arc but to permit him to see his work, the improvement comprising a flexible gasket protruding from the inside surface of the face mask, the base of which gasket includes separable fastening means cooperating with mating fastening means on the inside surface wherein said gasket is removably secured to that inside surface, the gasket circumscribing the viewing means, to flushly meet the face of the wearer and encircle his eyes to prevent indirect radiation from being reflected thereto, the shield further comprising a head harness and the mask being directly secured to the head harness by a pivot located on a vertical extension that projects above the head encircling portion of the harness for unobstructed movement of the shield from a position above the face of the wearer to a face shielding position or vice versa, manually operable means for adjustably securing the face mask in these positions or positions therebetween.

4,185,330

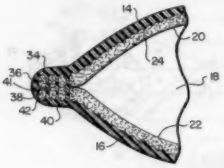
DISPOSABLE COSMETIC GLOVE

Phyllis H. Stager, 14900 S.W. 80th Ave., Dallas, Tex. 33158

Continuation-in-part of Ser. No. 782,004, Mar. 28, 1977, Pat. No. 4,122,554. This application Oct. 30, 1978, Ser. No. 955,916

Int. Cl.[2] A41D *19/00*

U.S. Cl. 2—164 **8 Claims**



1. An article to place in contact with the body for use in applying a cosmetic or therapeutic substance to the skin including first and second superposed composite substrates and a therapeutic or cosmetic composition carried by said composite substrates, each composite substrate comprising a first lamina of a lotion impervious thermoplastic resin and a second lamina of a lotion absorbent spun fiber material bonded to said first lamina, said first and second composite substrates having marginal edge portions bonded together by the application of heat and pressure defining a sealed rim, said sealed rim being characterized by the union of melted thermoplastic resin material from each substrate enclosing the fibers of each substrate and filling interstitial regions between the fibers of each substrate substantially along the zone of application of heat and pressure.

4,185,331

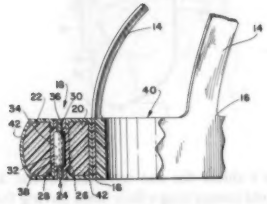
PROTECTIVE HEAD DEVICE

Tetsuo T. Nomiyama, 1526 Century Blvd., Santa Ana, Calif. 92703

Filed Sep. 14, 1978, Ser. No. 942,300

Int. Cl.[2] A42B *1/08;* **A63B** *71/10*

U.S. Cl. 2—411 **5 Claims**



1. In combination, a protective head device comprising:

a dome head-receiving member having a base band to fit about the wearer's head;

a resilient head band secured to the inner side of said base band;

shock-absorbing means mounted to the outer side of said base band arranged to dissipate shock received upon impact thereto; and

bearing means interposed within said shock-absorbing means to allow a portion of said shock-absorbing means to move relative to said base band;

said shock-absorbing means comprising an inner shock absorbing band member secured to said base member in a substantially fixed position, and an outer shock-absorbing band member attached to said bearing means so as to move relative to said inner shock-absorbing band; and

wherein said bearing means comprises:

a first raceway secured to said inner shock-absorbing band member, whereby said first raceway is relatively stationary with respect to said base band;

a second raceway oppositely disposed to said first raceway for relative movement therebetween wherein said outer shock-absorbing band is affixed to said second raceway so as to move therewith upon impact thereto;

a plurality of bearing members interposed between each of said raceways; and

a bearing cage member to hold said bearing in respective adjacent positions within said raceways.

4,185,332

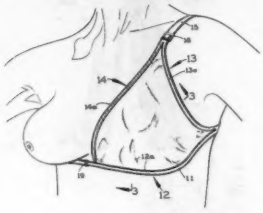
BREAST FORM HOLDER

Dorothy S. Jahnig, 14900 SW. 80th Ave., Miami, Fla. 33158

Filed May 19, 1978, Ser. No. 907,555

Int. Cl.[2] A41C *3/10*

U.S. Cl. 3—36 **4 Claims**



1. A self-contained single breast form holder to be worn either with or without a separate brassiere by a woman with an amputated breast, said holder comprising:

a flexible back panel of soft, thin, stretchable material shaped and dimensioned to overlie the wearer's amputated breast;

a flexible front panel of soft, thin, stretchable material extending completely across the front of said back panel;

said back and front panels being shaped and dimensioned to cover the surgically disfigured area of a woman's amputated breast;

each of said panels being substantially three-sided presenting a bottom side, an outer side which is inclined upward and laterally inward from the outer end of said bottom side, and an inner side which is inclined upward and laterally outward from the inner end of said bottom side and is joined to the outer side at the top of the panel;

stitching securing said panels to each other along their bottom and inner sides; manually separable fastener means acting between said panels along their outer sides to releasably attach them together thereat;

said panels being separate from each other except at said stitching and said manually separable fastener means, whereby to form a pocket between them for receiving a woman's breast form inserted between them when last-mentioned fastener means is separated to provide an opening leading into said pocket;

a body band fastened to said panels along their bottom edges, said body band extending beyond said outer sides of the panels and providing an elongated flexible strap adapted to extend across the wearer's back and around the opposite side of the wearer and beneath her other breast;

manually separable fastener means on the opposite ends of said body band for releasable attachment to each other below and between the wearer's breasts;

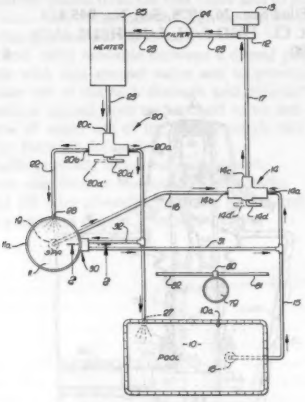
and a shoulder strap extending from the juncture between said outer and inner sides at the top of the panels down to said body band beyond said outer sides of the panels, whereby to overlie the wearer's shoulder at the side where the amputated breast is located;

said shoulder strap and said body band together positioning the breast form holder on the wearer independent of any brassiere or other garment she may be wearing.

4,185,333
CIRCULATION AND LEVEL CONTROL VALVE

Robert Ortega, Fountain Valley, Calif., assignor to Purex Corporation, Lakewood, Calif.

Filed Jun. 12, 1978, Ser. No. 914,372
Int. Cl.[2] E04H 3/16, 3/18
U.S. Cl. 4—172.15 17 Claims



1. In a system for circulating liquid to and from multiple liquid bodies, the system including pump means and ducting connected with said bodies, the combination which comprises:

(a) control means associated with one liquid body, and in communication with said liquid ducting, which in turn communicates with another of said liquid bodies, for controlling and maintaining water circulation to and from said one liquid body while controlling the level of said one liquid body, in response to changes in the surface level of said one liquid body,

(b) said control means including a float and float controlled valving, said float sensing the level of liquid in said one liquid body,

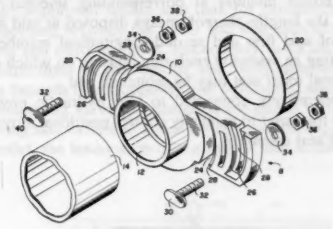
(c) said valving including an upper valve to control liquid flow from the one liquid body, and a lower valve to control liquid flow to said one liquid body, there being a common connection to displace said valves simultaneously to maintain flow to and from the one body so as to control the surface level thereof, the valving including seats spaced from the valves and cooperating therewith so as to tend to increase flow past the upper valve when flow past the lower valve is decreased and to decrease flow past the upper valve when flow past the lower valve is increased.

4,185,334
WALL URINAL MOUNTING FLANGE

Lewis B. Izzi, 918 Surrey Dr., Shelby, N.C. 28150

Filed Nov. 21, 1978, Ser. No. 962,759
Int. Cl.[2] E03C 1/00
U.S. Cl. 4—191 1 Claim

1. A device for mounting a urinal or similar fixture having spaced mounting holes on the end of a drain pipe projecting through an opening in a wall comprising a cylindrical body having a pipe-receiving socket to be welded to said pipe; said device having a pairof laterally and diametrically oppositely extending flanges and an arcuate slot formed in each concentrically with said body; said slots having the same spacing as said urinal mounting holes and being adapted to receive urinal supporting bolts movable in said slots so as to be sucured therein in a horizontal plane to receive and support said urinal in a leveled position; and a tubular rim formed on the outer face of said body for receiving an annular seal to be compressed between said urinal and said flange body by said bolts; and a second arcuate slot formed in each of said laterally extending flanges concentric with said body at predetermined spacings from said first mentioned slots so as to fit spaced

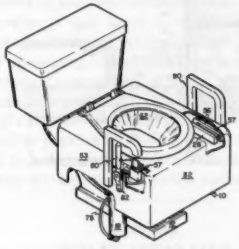


urinal mounting holes having a different predetermined spacing, each of said flanges having the slots opening in different directions, slots at the same radius opening in the same rotational direction.

4,185,335
MOVABLE TOILET SEAT ASSEMBLY

Robert L. Alvis, Albuquerque, N. Mex., assignor to Medical Aids Research Foundation, Albuquerque, N. Mex.

Filed May 24, 1978, Ser. No. 908,801
Int. Cl.[2] A47K 3/12
U.S. Cl. 4—251 7 Claims



1. A toilet seat assembly particularly adapted for use by handicapped persons, movable and adjustable within a preselected positional range, said assembly being fittable to a conventional toilet bowl having a conventional water supply, said assembly comprising:

means for affixing said assembly to said conventional toilet bowl;

means for tapping said conventional water supply and for hydraulically powering said assembly;

means operatively connected to said hydraulic powering means for providing a range of human body supporting positions for said assembly, said range of positions being from a lowered, knees-bent seater user position, essentially vertically, to an intermediate raised user supporting position essentially without transfer of weight to a user's legs, therefrom forward and slightly upward arcuately to a fully extended position, gradually transfering the weight of the user to the user's feet, said affixing means comprising an essentially rectangular frame affixable on said conventional toilet bowl, said frame having a front and a back corresponding to the front and back of a conventional toilet bowl, said positional range means comprising a first pair of parallel longitudinal members having first and second ends, interconnected at said first ends by a first torsion bar pivotally mounted on the front of said frame, a second pair of parallel longitudinal members having first and second ends, interconnected at said first ends by a second torsion bar pivotally mounted on the rear of said

frame, a pair of vertical links pivotally interconnecting respective first and second longitudinal members, each of said vertical links being pivotally attached at one end to a first longitudinal member and at its other end to a second longitudinal member at corresponding selected points along the lengths thereof, means disposed at said second ends of said first and second longitudinal members for mounting an assembly enclosing housing on which a conventional toilet seat may be mounted; and

means operatively connected to said hydraulic powering means for a user to manually control positional movement of said seat assembly.

4,185,336

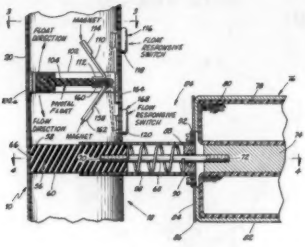
ELECTRICALLY CONTROLLED DRAIN AND VENT SYSTEM FOR SINKS AND THE LIKE

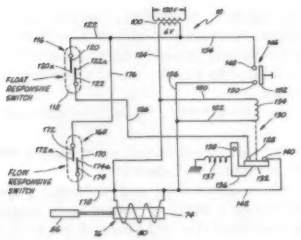
Lyle M. Young, 1807 W. Minnehaha, St. Paul, Minn. 55104

Filed Sep. 11, 1978, Ser. No. 941,280

Int. Cl.[2] A47K *1/14;* **E03C** *1/26, 1/242*

U.S. Cl. 4—286 **17 Claims**





1. A drain system for sinks and the like having a drain line associated therewith comprising a movable valve member for closing said drain line when in a first position and opening said drain line when in a second position, means normally biasing said valve member into its said first position, a solenoid for overcoming said biasing means to move said valve member to its said second position when said solenoid is energized, means for energizing said solenoid to move said valve member from its said first position to its said second position, said energizing means including a pushbutton switch for manually effecting energization of said solenoid, and flow responsive means including a normally open switch in parallel with said pushbutton switch so that said solenoid remains energized during the period that water is flowing through said drain line.

4,185,337

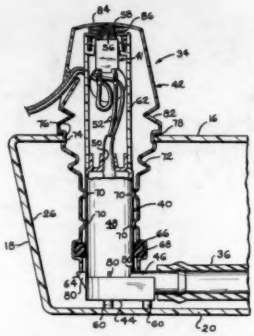
PORTABLE TOILET WITH IMPROVED FLUSH APPARATUS

Frank T. Sargent; John M. Antos; Arthur W. Henke, all of Ann Arbor; James T. Embach, Saline, all of Mich.; Frederick A. Butler, Leamington Spa, England, and Erin J. Lindsay, Ann Arbor, Mich., assignors to Thetford Corporation, Ann Arbor, Mich.

Filed Sep. 26, 1978, Ser. No. 945,814

Int. Cl.[2] E03D *5/01, 5/10;* **H01H** *13/06*

U.S. Cl. 4—300 **6 Claims**



1. A portable toilet that includes a portable upper section providing a bowl that has an opening at the bottom and providing a water tank for storage of water for flushing said bowl, said water tank having an aperture in a top wall portion thereof for mounting a manually actuatable pump apparatus for pumping water from said tank to said bowl for flushing purposes, characterized in that a pump apparatus is mounted on said top wall portion comprising an electrically operated submersible pump having a water inlet located adjacent to the bottom of said tank and an electrical switch for energizing said pump when the switch is closed, said switch being located externally of said tank for manual actuation and rigidly mounted on said pump at an elevated position above said top wall portion, said switch being normally biased open and responsive to pressure exerted thereon to move to a closed position so that flushing of said bowl can occur only while said switch is maintained closed by the exerted pressure, and a housing encloses said switch and the upper portions of said pump in sealed relationship, seal means are provided between the lower end of said housing and said pump to prevent escape of water from the tank into said housing, said housing also being secured in a sealed relationship to the edge of said aperture in said top wall portion and being flexible to permit deflection of the housing for actuation of the switch therein.

4,185,338

TOILET FLUSHING APPARATUS

Nicholas P. Bresnyan, 214 Candlewood Rd., Groton, Conn. 06340

Filed May 18, 1978, Ser. No. 907,094

Int. Cl.[2] E03D *1/14, 5/09*

U.S. Cl. 4—327 **8 Claims**

1. In combination with a toilet including a tank capable of being filled with water and having an outlet for draining water therefrom, a hollow support member mounted on the tank including a first valve seat communicating with the outlet, and a hollow standpipe mounted on said support member and extending upwardly therefrom, the interior of said standpipe being in communication through said support member with the outlet, the improvement comprising:

a tubular sleeve mounted to the standpipe and spaced therefrom;

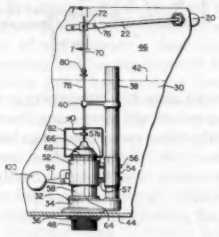
a cylinder having upper and lower ends and slideably received within said sleeve and including a first valve fixed to its lower end movable between a closed position engageable with the first valve seat to prevent the flow of water out of the tank through the outlet and an open position spaced from the first valve seat to permit the flow of water out of the tank through the outlet, said upper end defining a second valve seat;

a second valve movable between a closed position engageable with said second valve seat to prevent the flow of water out of the tank through said cylinder and an open position spaced from said second valve seat to permit the flow of water out of the tank through said cylinder and then through the outlet;

a handle pivotally mounted on said tank;

a lever arm fixed at one end to said handle;

a first lift wire pivotally mounted at one end to said lever arm at a location distant from said handle;



a second lift wire fixed at one end to said second valve, said first and second lift wires being connected together and adapted for universal movement at locations intermediate said lever arm and said second valve, said first and second lift wires being relatively movable longitudinally;

a guide bracket fixed to the standpipe and effective to guide said second lift wire as it moves said second valve means between said open and closed positions;

a bail member fixed to said cylinder and slideably received on said second lift wire whereby rotation of said handle through the first range of travel causes said second lift wire to lift said second valve for disengagement from said second valve seat; and

adjustable stop means including a nut threadedly received on said second lift wire engageable with said bail whereby continued rotation of said handle through the second range of travel causes said bail to engage said nut and lift said first valve to enable the flow of water out of the tank through the outlet.

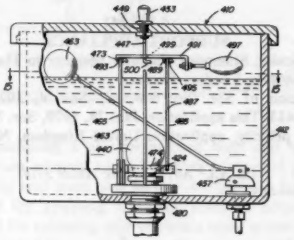
4,185,339

WATER CLOSET TANK AND INCLINED OUTLET VALVE BALL ELEMENT SUPPORT THEREFOR

Juan A. Morales, P.O. Box 14, El Palo, Malaga, Spain

Filed Nov. 2, 1977, Ser. No. 848,013
Int. Cl.[2] E03D *1/30, 1/35, 5/09*
U.S. Cl. 4—378 **7 Claims**

1. A flush tank having a lower outlet opening upwardly into said tank and a free buoyant valve ball in said tank for seating engagement in said outlet from above to close the latter, float controlled water inlet means for said tank operative to admit water into said tank in response to the level of water therein dropping below a predetermined level, first and second inverted U-shaped members each including a pair of upstanding generally parallel legs interconnected at their upper ends by means of a connecting bight portion extending and connecting therebetween, said inverted U-shaped members being disposed in generally parallel relation on opposite sides of said outlet, the lower ends of the legs of said first member being stationarily supported relative to said outlet, a third horizontal U-shaped member including a pair of generally parallel legs interconnected at one pair of corresponding ends by a bight portion extending therebetween, said third member being pivotally supported within said tank for oscillation about an axis extending between the lower and free ends of the legs of said first and third members, respectively, with the longitudinal midportions of the legs of said third member disposed closely beneath lower opposite side portions of said ball valve and comprising valve ball displacement means for selectively displacing said valve ball upwardly from seated engagement in said outlet, the lower ends of the legs of said second member



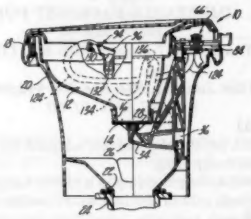
being pivotally attached to opposite side portions of said third member adjacent the bight portion thereof, an elongated horizontal lever, means pivotally attaching one end of said lever to the bight portion of said first member, means pivotally anchoring a midportion of said lever to the bight portion of said second member, a float carried by the other end of said lever, and a pair of upstanding rods disposed on opposite sides of said outlet intermediate corresponding legs of said first and second members and stationarily supported relative to said outlet, said rods and legs comprising vertical guide members operative to guide said ball to position for seating in said outlet as the water level in said tank drops after said ball has been unseated from said outlet and allowed to float to the surface of said water.

4,185,340

TOILET APPARATUS

Frank T. Sargent; Arthur W. Henke; John M. Antos, all of Ann Arbor, and John T. Cameron, Dearborn Hts., all of Mich., assignors to Thetford Corporation, Ann Arbor, Mich.

Filed Nov. 22, 1978, Ser. No. 962,898
Int. Cl.[2] E03D *5/01, 5/012, 5/09*
U.S. Cl. 4—441 **17 Claims**



1. Toilet apparatus comprising a bowl having at its bottom a discharge outlet, a housing supporting said bowl, flush means for discharging flush water into said bowl, and a sealing mechanism for closing and opening said bowl outlet, said sealing mechanism having a seal member mounted on said bowl around said bowl outlet and projecting downward below the lower extremity of the outlet, a blade of larger area than said bowl outlet, and an actuator arm for movement of the blade

between a first position wherein said blade is located under said bowl outlet and is urged upward at a pressure of relatively high magnitude into engagement with said seal member for closing the bottom of the bowl and a second position wherein said blade is at one side of said outlet, characterized in that actuating means for opening and closing the bowl outlet are operatively associated with said actuator arm and said blade, said actuating means being operable when actuated for opening said bowl outlet to reduce initially the magnitude of the upward pressure of the blade on the sealing member to a pressure of lower magnitude and thereafter to move said blade substantially horizontally toward said second position while the pressure of lower magnitude exerted by the blade on the sealing member is maintained.

4,185,341

SUPPORT APPLIANCE

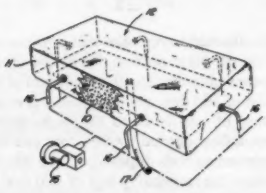
John T. Scales, Stanmore, England, assignor to The Institute of Orthopaedics, London, England

Continuation of Ser. No. 848,520, Nov. 4, 1977, Pat. No. 4,136,413. This application Jan. 23, 1979, Ser. No. 5,878

Claims priority, application United Kingdom, Nov. 8, 1976, 46432/76

Int. Cl.[2] A47C *27/08;* A61F *5/00*

U.S. Cl. 5—461 **2 Claims**



1. A method of using a support appliance, which appliance comprises a resilient air permeable body capable of supporting a user, and a cover extending over at least that portion of the body which supports the user, the cover comprising a material which is free-water proof but is chemically/physico-chemically porous to permit transmission of gaseous water vapour on the outside of said portion of the surface area to within the body and from which the water vapour can be dispersed when subjected to a differential water vapour pressure, said method comprising supporting a user on said appliance and relying solely on the effects of the weight and movements of the user thereupon to cause said transmission and dispersal of gaseous water vapour.

4,185,342

PORTABLE, ADJUSTABLE BACKREST FOR BEDS AND THE LIKE

Raymond E. Young, 10717 Juniper Hills Rd., Littlerock, Calif. 93543

Filed Jun. 16, 1978, Ser. No. 916,265

Int. Cl.[2] A47C *21/00*

U.S. Cl. 5—433 **8 Claims**

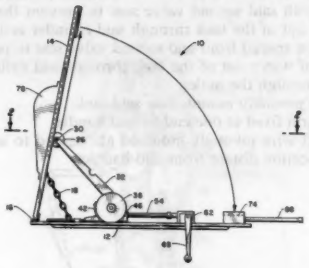
1. A portable, adjustable backrest adapted for use on a bed, sofa or the like comprising:

a base adapted to be placed upon a planar supportive surface such as a bed, sofa or the like, said base having a fore end and an aft end;

a backrest panel being hingedly connected to said fore end of said base, said backrest panel being pivotable from a first position approaching abutting contact with said base to a second position approaching perpendicular to said base, said backrest panel having a front side and a backside;

means for moving said backrest panel from said first position to said second position, said means includes an arm assembly in continuous contact by contact means with said backside of said backrest panel, said arm assembly being movable along the surface of said backside by a drive means, said drive means being mounted on said base, whereby upon operation of said drive means said arm assembly being moved causing pivoting of said backrest panel;

said drive means including a disc assembly, said disc assembly being fixed to said arm assembly, said disc assembly being pivotable to thereby cause pivoting of said arm assembly; and



a flexible strap assembly comprising at least one elongated strap, one end of said strap being fixed to said disc assembly with the other end of said strap being fixedly attached to said base, whereby longitudinal movement of said disc assembly results in said disc assembly rolling upon said strap assembly thereby causing pivoting of said disc assembly and pivoting of said arm assembly.

4,185,343

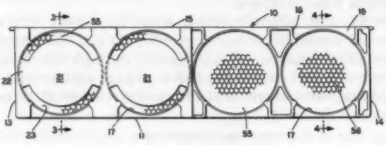
FRAME CONSTRUCTION FOR MAKING ROUND COMB HONEY

Thomas B. Ross, 1721 10th St., NE., Massillon, Ohio 44646

Filed Sep. 15, 1978, Ser. No. 942,767

Int. Cl.[2] A01K *47/02*

U.S. Cl. 6—10 **8 Claims**



1. A frame construction for use in making round comb honey of the type having a generally rectangular configuration formed with a plurality of space cylindrical-shaped openings adapted to removably receive a ring in each of the openings, in which each of the frame openings is defined by a cylindrical wall having first and second pairs of opposed arcuate zones, with said first pair having a shorter axial height than the second pair in order to form access openings for bees when a plurality of said frames are stacked in abutting relationship within a beehive, and in which first and second pairs of inwardly extending projections are formed on the ends of the second pair of wall zones adjacent the first pair of wall zones for supporting a ring telescopically mounted within the opening formed by the cylindrical wall, wherein the improvement includes one of the wall zones of the second pair having an arcuate length greater than the arcuate length of the other wall zone of said second pair.

4,185,344
INSTALLATION FOR DYEING TEXTILE MATERIAL IN WEB FORM

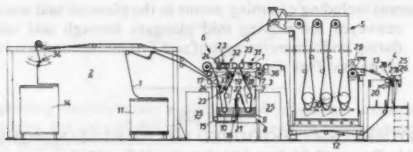
Johannes Kutz, St. Tönis near Krefeld, Fed Rep. of Germany, assignor to Eduard Küsters, Krefeld, Fed. Rep. of Germany

Filed Aug. 8, 1978, Ser. No. 931,888

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1977, 2736835

Int. Cl.² D06B *21/00*

U.S. Cl. 8—149.1 **6 Claims**



1. An installation for dyeing textile material in web form comprising: a steamer; a dyeing liquor application mechanism disposed on one side of said steamer; a dual washing device having a common housing and having disposed therein a preliminary washing device and a final washing device disposed on the other side of said steamer; and means for guiding the web in a direction of forward travel into said preliminary washing device, from said preliminary washing device to said dyeing liquor application mechanism and in a reverse direction from said dyeing liquor application mechanism, into and through said steamer, from said steamer into said final washing device and out of said final washing device, the path of said web in the forward direction being essentially below the path of said web in the reverse direction.

4. A method of improving the compactness and accessibility of an installation for dyeing textile material in web form which includes a preliminary washing device, a dyeing liquor application mechanism, a steamer and final washing device comprising:

(a) disposing the preliminary washing device and final washing device immediately adjacent to each other in a common housing whereby both of said washing devices can be fed by a common set of pumps and piping;

(b) feeding said web to and through said preliminary washing device and then to said dye liquor application mechanism in a forward travel direction;

(c) reversing the direction of travel of said web in the vicinity of said dye liquor application mechanism; and

(d) feeding said web in a reverse direction through said steamer and to and through said final washing device.

4,185,345
NEG'ATOR SPRING POWERED UNDERWATER LAUNCHING DEVICE

Francis J. Waclawik, Bristol; James P. Muzaca, Tiverton, both of R.I.; Robert A. Cook, Swansea; William A. Hardin, Westport, both of Mass.; Alfred D. Silvia, Portsmouth, R.I., and Ronald Correia, Fall River, Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 24, 1978, Ser. No. 899,184

Int. Cl.² B63B *21/52*

U.S. Cl. 9—8 R **4 Claims**

1. An underwater launching device comprising:

a buoy adaptable for underwater launch;

a cage having an opening at one end, said cage adapted to hold said buoy prior to launch;

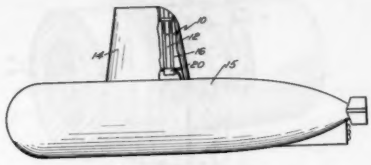
restraining and release means positioned for restraining said buoy and said cage prior to launch and for initiating launch by releasing said buoy and said cage;

acceleration means connected to said cage for accelerating said cage and said buoy upon release of said buoy;

guide means aligned with said cage for guiding said cage a predetermined distance upon operation of said acceleration means;

deceleration means aligned with said cage for stopping said cage after said cage has been guided by said guide means the predetermined distance; and

muzzle pop-out plug means aligned with said buoy for providing protection to said buoy from external forces prior to launch and for ejecting with negligible obstruction and degradation to said buoy at launch, said muzzle pop-out plug means further comprises a muzzle plug release mech-



anism including a plunger aligned with said buoy, said mechanism adapted to be actuated when said plunger is struck by said buoy and further including a pair of pins adapted for gripping sidewalls prior to actuation and adapted for releasing said sidewalls upon actuation, and a plug adapted for providing protection to said buoy from external forces prior to actuation of said muzzle plug release mechanism and for ejecting with negligible obstruction and degradation to said buoy upon actuation of said muzzle plug release mechanism.

4,185,346
SAFETY DEVICE FOR SAIL YACHTS

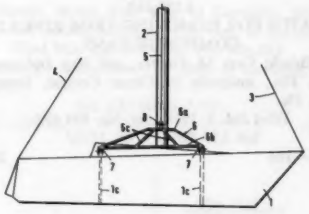
Fritz Adrian, Ratingen, Fed. Rep. of Germany, assignor to Balcke-Dürr Aktiengesellschaft, Ratingen, Fed. Rep. of Germany

Filed Nov. 1, 1977, Ser. No. 847,484

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1976, 2651181

Int. Cl.² B63B *17/00*

U.S. Cl. 9—1.7 **3 Claims**



1. A safety device for sailing yachts with a mast and with a substantially flat and construction-free deck, respectively, and with articulation points for shrouds, which articulation points are positioned spaced from the ship's side, comprising

one safety railing each being arranged at both sides of the mast,

each said safety railing extends arched substantially in the longitudinal direction of the ship as well as being spaced from the ship's side, and the shrouds, respectively being fastened to each said safety railing,

said safety railing includes,

a curved upper belt,

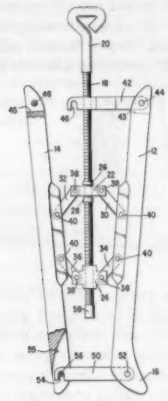
a lower belt extending substantially parallel to the deck, and

struts extending between said lower belt and said upper belt.

4,185,347
BOOT STRETCHER

Seung H. Yang, 41-31 51st St., Long Island City, N.Y. 11377

Filed Jun. 9, 1978, Ser. No. 914,136
Int. Cl.[2] A43D 5/00
U.S. Cl. 12—114.6 9 Claims

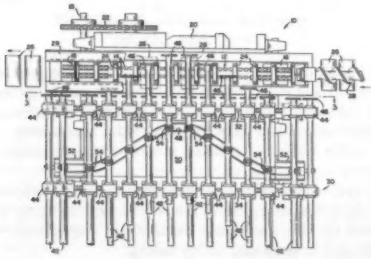


1. Apparatus for selectively stretching all or portions of a boot comprising: a main boot stretching body comprising front and rear halves generally conforming to the shape of the boot portion to be stretched; a rotatable elongated rod; first and second expandable pivotally mounted linkage means inter-connecting said body halves and mounted for cooperation with said rotatable rod for causing relative movement of said halves in opposite directions; said first linkage means being movable relative to said rod and said second linkage means being fixed relative to said rod; and, a first and second latching means located exterior of said first and second linkage means operably associated with said front and rear halves for enabling at least a selected portion of said front and rear halves to spread apart from their normal position when said latching means connects an end of said halves.

4,185,348
APPARATUS FOR REMOVING TRIM RINGS FROM COMPOSITE CANS

James E. Brock; Cara M. Gentry, and Ray DeUnger, all of Orlando, Fla., assignors to Citrus Central, Incorporated, Orlando, Fla.

Filed Jul. 3, 1978, Ser. No. 921,473
Int. Cl.[2] B08B 9/08, 11/02
U.S. Cl. 15—101 20 Claims



1. Apparatus for removing foreign and undesirable materials from a plurality of open-ended lengths of hollow tubing, said apparatus comprising:

a first conveyor for transporting said plurality of tubes in a first direction;

means for indexing said tubes on said conveyor in spaced, paralliel relation with an open end of all of said tubes facing in a direction which is substantially transverse to said first direction;

a second conveyor positioned along said first conveyor;

drive means coupled for driving said first and second conveyors at a uniform rate in said first direction;

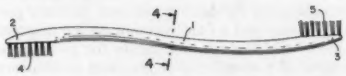
a plurality of plungers parallel to said cans and carried by said second conveyor; and

means including camming means in the plane of said second conveyor for moving said plungers through said tubes during uniform movement of said first and second conveyors in said first direction.

4,185,349
TOOTHBRUSH CONTOURED TO THE HUMAN MOUTH

Sophia Papas, 49 Mellow Ln., Jericho, N.Y. 11753

Continuation of Ser. No. 704,756, Jul. 12, 1976, abandoned. This application Dec. 28, 1977, Ser. No. 865,175
Int. Cl.[2] A46B 9/04
U.S. Cl. 15—106 1 Claim



1. a toothbrush comprising a flattened "s" shaped handle having oppositely directed sections on the ends of said handle,

said handle having parallel convex and concave curved surfaces along said handle extending to said bristle sections,

each bristle section having a flat base surface extending from the end of the concave surface to the outer end of each bristle section,

said bristle sections being equidistantly spaced from the mid-portion of said handle,

said flat base surfaces being coplanar with each other and with the mid-portion of said handle,

said handle having a constant circular cross-section extending between said flat base surfaces,

the outer ends of each bristle section having a hemispheric shaped surface which converges to a bullet shaped tip portion, the maximum width of each bristle section in the lateral direction being equal to the lateral width of said handle, whereby,

when inserted into the natural curvature of the mouth, between the cheecks and rows of teeth from the beginning of the oral cavity to its inner molars, the cheecks are forced up, over, and around said bullet shaped tip and hermispheric shaped surface and the bristles hugg the curvature of the teeth by the counter pressure of the cheecks against said bullet shaped bristle section.

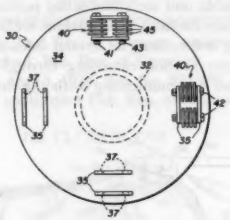
4,185,350
SCARIFYING ATTACHMENT FOR FLOOR MACHINE

Ronald W. Fish, Roselle, Ill., assignor to Trico Equipment Corporation, Chicago, Ill.

Filed Jul. 31, 1978, Ser. No. 929,709
Int. Cl.[2] A47L 13/02
U.S. Cl. 15—236 C 9 Claims

1. An attachment plate for mounting scarifying members on a rotary floor maintenance machine having a single vertical shaft, said plate comprising a substantially flat circular disc, a cylindrical attachment collar connected to one side of said disc and extending therefrom coaxially therewith for coupling said disc to the shaft of the associated machine for rotation therewith, a plurality of groups of holding members secured to the other side of said disc and spaced apart equiangularly thereabout and disposed entirely within the perimeter thereof, the

holding members of each group of holding members being spaced apart radially of said disc and having two sets of horizontally aligned coaxial apertures therethrough for rotatably



supporting therebetween a plurality of associated scarifying members, the axes of the two sets of apertures being substantially parallel.

4,185,351

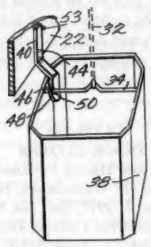
CHIMNEY CLEANING APPARATUS

Joseph L. Radsavitch, 262 State St., Larksville, Pa. 18704

Filed Sep. 5, 1978, Ser. No. 939,883

Int. Cl.[2] F23J *3/00*

U.S. Cl. 15—243 **7 Claims**



1. Chimney cleaning apparatus, comprising:

means for movement within the chimney for cleaning the interior of the chimney;

means in operative relationship with said cleaning means for moveably supporting said cleaning means inside the chimney; and

means in operative relationship with said supporting means for holding said cleaning means in a fixed position when said apparatus is not in use, said holding means including an arm moveably attached to said supporting means and defining a hook at one end thereof for receiving and holding a portion of said cleaning means when said cleaning means is in said fixed position, said holding arm being rotatably attached to said supporting means about an axis positioned to cause said hook end of said holding arm to normally be positioned below the other portions of said holding arm when said arm is in a normal, at-rest position, and wherein said hook defines an end camming surface and a slot having an inner camming surface.

4,185,352

SCRAPED-SURFACE APPARATUS

Robert L. Smith, Louisville, Ky., assignor to Chemetron Corporation, Chicago, Ill.

Filed Feb. 10, 1978, Ser. No. 876,596

Int. Cl.[2] F28G *3/12*

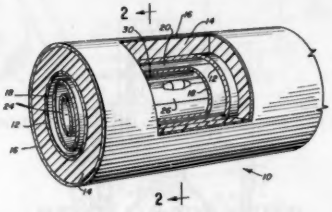
U.S. Cl. 15—246.5 **7 Claims**

1. In a scraped-surface apparatus of a type comprising:

(a) a tube having an inner cylindrical wall;

(b) a shaft concentric with the wall and rotatable about a common central axis of the axis of the shaft and the wall, so as to define an elongated annual space to confine a product to be processed in the tube between the shaft and the wall; and

(c) a plurality of scraper blasts of a material that does not score said wall, each blade being hinged to the shaft for pivotal movement about an axis substantially parallel to the axis of about which the shaft rotates, one edge of each



blade leading a plane defined by said axes to scrape the product from the wall as the shaft rotates in a given rotation sense;

an improvement wherein said blades are spaced around said shaft in circumscribing relation thereto and each blade bears on the wall at a surface near said plane as the shaft is rotated, so as to center and support the shaft and facilitate its rotation, and so as to hold said edge in uniform scraping relation to the wall as the shaft thus rotates.

4,185,353

WIPING ARRANGEMENT FOR WIPING A VEHICLE WINDOW, AND A METHOD OF MANUFACTURING THE SAME

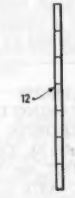
Gerhard Ulbrich, Buehl, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 10, 1978, Ser. No. 904,582

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1977, 2732759

Int. Cl.[2] B60S *1/38*

U.S. Cl. 15—250.36 **11 Claims**

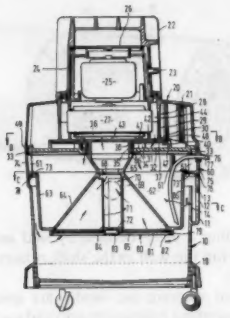


1. A wiping arrangement for wiping a vehicle window, comprising an elongated wiping element turnable about an axis and arranged to contact the vehicle window during such turning so as to wipe the same, said wiping element being constituted of a material having a coefficient of friction which differs in the direction of elongation of said wiping element.

4,185,354
APPARATUS FOR CLEANING FLOORS, CARPETS AND THE LIKE

Alan J. Brazier, Alvechurch, England, assignor to Vax Appliances Limited, Bromsgrove, England

Filed May 12, 1978, Ser. No. 905,417
Claims priority, application United Kingdom, May 13, 1977, 20152/77; Nov. 5, 1977, 46144/77
Int. Cl.[2] A47L 7/00
U.S. Cl. 15—321 10 Claims



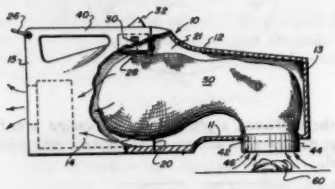
1. Suction cleaning apparatus comprising:
(a) container means for the collection of both wet and dry matter and having an inlet for connection with a cleaning head;
(b) motor driven air suction means with an air exhaust outlet and an air inlet communicating with said container means for applying suction thereto;
(c) filter means for retaining dry matter within said container means so as to enable the apparatus to be used for dry suction cleaning;
(d) detachable reservoir means for storing cleaning liquid;
(e) delivery means for delivering said liquid to said cleaning head so as to enable the apparatus alternatively to be used for wet cleaning;
(f) said reservoir means and said filter means being interchangeably assembled with said container means and suction means so that the filter means is used in the absence of said reservoir means and vice versa;
(g) an air passageway in said reservoir means extending from the interior of said container means to the air inlet of said suction means, and a shut-off valve in association with said passageway to close the latter in response to the level of liquid collected in said container means; and
(h) air-flow director means separate from said air passageway for directing air from said exhaust outlet of the suction unit alternatively to atmosphere when the filter means is in use or to the interior of the reservoir means when the latter is in use so as to displace liquid from the reservoir means to the cleaning head, while in either case suction from the suction outlet is simultaneously applied to the container means through said air passageway.

4,185,355
APPARATUS FOR CLEANING UP ANIMAL FECES DEPOSITS

Robert W. Williams, 429 Cedar St., Lansdale, Pa. 19446

Filed Nov. 30, 1977, Ser. No. 855,968
Int. Cl.[2] A47L 5/24
U.S. Cl. 15—344 4 Claims

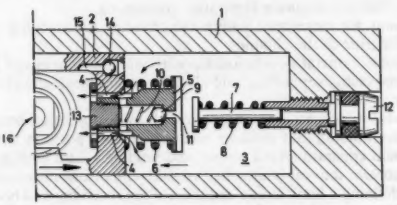
1. Apparatus for cleaning up a deposit of animal feces from its situs without any physical touching of the animal feces deposit by the user of the apparatus, comprising
a casing adapted to be held in a clean-up position,
a disposable unit constructed and arranged such that any part of the animal feces deposit that would normally contact the apparatus as it is picked up comes into contact only with said disposable unit,
said disposable unit being removable from said casing for disposal,
said disposable unit including a bag portion pervious to the flow of air forming a receptacle within said casing for receiving and holding an animal feces deposit,
and an intake portion extending through the wall of said casing and communicating with the interior of said bag portion to form an intake passage for the flow of outside air and an animal feces deposit into the interior of said bag portion, and
suction producing means mounted within said casing for causing an air flow to create a suction at said intake passage sufficient to pick up an animal feces deposit from its situs and cause the same to move into the interior of said bag portion when said casing is held in a clean-up position with said intake passage in close proximity to an animal feces deposit to be cleaned up.



4,185,356
DOOR CLOSER

Markku Kuivalainen, and Hannu Pehkonen, both of Joensuu, Finland, assignors to Oy Wartsila Ab, Helsinki, Finland

Filed Dec. 5, 1977, Ser. No. 857,667
Claims priority, application Finland, Dec. 13, 1976, 763571
Int. Cl.[2] E05F 3/10
U.S. Cl. 16—52 11 Claims



1. A door closer comprising a movable piston member including a main flow duct with a movable valve body; said piston member having a power transmitting connection to a door; a pressure medium and chambers; the movements of said door causing said piston member to pump said pressure medium within said door closer from one of said chambers to another of said chambers through said main flow duct; said piston member further comprising a flow limiting member including a throttled duct and influencing at least the speed of the opening movement of said door; an adjustable activating element; said flow limiting member being arranged to cooperate with said adjustable activating element, said activating element being arranged in a desired opening phase of said door to mechanically move said valve body into a position closing said main flow duct to force said pressure medium to flow through said throttled duct, for substantially increasing the flow resistance of said pressure medium to brake the move-

ment of said piston member and thereby to brake the movement of said door.

4,185,357

FURNITURE HINGE COMPONENT

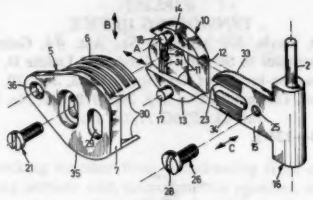
Peter Busse, Vlotho, Fed. Rep. of Germany, assignor to Richard Heinze Co., Herford, Fed. Rep. of Germany

Filed Apr. 3, 1978, Ser. No. 892,952

Claims priority, application Fed. Rep. of Germany, May 26, 1977, 2723850

Int. Cl.² E05D *7/04*

U.S. Cl. 16—130 **18 Claims**



1. In a furniture hinge for pivotally connecting two parts of a piece of furniture, and in particular a door to a body of a piece of furniture, a first hinge component mounted on one part of the piece of furniture and having at least one pivot, which connects the first hinge component in an articulating manner with a second hinge component mounted on the other part of furniture, the first hinge component including a fastener member anchored in a bore hole in a surface of one of the parts of the piece of furniture and a hinge arm member adjustably secured to the fastener member and carrying at least one hinge shaft defining said pivot, the improvement comprising:

a first hinge component having a carrier member having guide means on said carrier member and guide means consisting of a wall segment on the fastener member of said first hinge component for displaceably mounting said carrier member on said fastener member so as to be movable relative to said fastener along a first axis parallel to said hinge shaft, and for displaceably mounting said hinge arm member on the carrier member so as to be movable relative to said carrier member along a second axis perpendicular to the first; and means for clamping the carrier member to the fastener member and for clamping the hinge arm member to the carrier member.

4,185,358

APPARATUS FOR SHIRRING CASINGS

Richard Regner, and Gerd Schug, both of Mainz-Bretzenheim, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

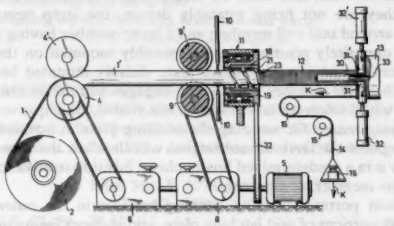
Continuation of Ser. No. 718,537, Aug. 30, 1976, abandoned, which is a division of Ser. No. 290,816, Sep. 21, 1972, Pat. No. 3,988,804. This application Aug. 9, 1978, Ser. No. 932,402

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1971, 2147498; Jun. 26, 1972, 2231144; Jun. 26, 1972, 2231145

Int. Cl.² A22C *13/02*

U.S. Cl. 17—42 **8 Claims**

1. In an apparatus for shirring cylindrical casings including means for moving a casing in the direction of its longitudinal axis, a hollow mandrel for supporting the casing, means for applying a force opposing the movement of the casing during shirring, shirring means and means for rotating said shirring means, said shirring means being mutually adjustable, including a motor for driving the means for advancing the casing and the means for rotating the shirring means, said motor and said advancing means being connected by a mechanical gear which allows mutual adjustment of the speed of the means for advancing the casing and the speed for rotating the shirring means, the improvement wherein said shirring means comprise a sleeve element having a helical projection extending from its cylindrical inner wall, adapted to be rotated about the longitudinal axis of the casing and constantly engaging it to shirr said casing.



4,185,359

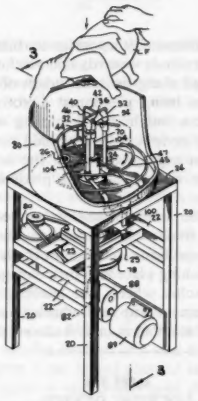
POULTRY CLEANING METHOD

Paul L. Niccols, Springfield, Mo., assignor to Harris Hatchery, Bentonville, Ark., a part interest

Division of Ser. No. 803,412, Jun. 3, 1977, Pat. No. 4,106,161. This application Jun. 6, 1978, Ser. No. 913,736

Int. Cl.² A22C *21/06*

U.S. Cl. 17—51 **11 Claims**



1. A method of removing contamination from the body cavity of a fowl comprising the steps of orienting the fowl in a substantially tail-downward vertical position, positioning the fowl on a support means holding the fowl in said position, directing water jets from a plurality of relatively movable nozzles positioned in the body cavity while moving at least one group of said nozzles with respect to the fowl and creating relative movement between another group of said nozzles and the fowl supporting means.

4,185,360

RATCHET BUCKLE FOR TIGHTENING AND TENSIONING STRAP

Ernest Prete, Jr., Woodland Hills, and Herbert N. Clay, Mission Hills, both of Calif., assignors to Ancra Corporation, El Segundo, Calif.

Filed Aug. 14, 1978, Ser. No. 933,137

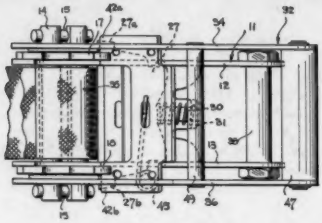
Int. Cl.² A44B *21/00*

U.S. Cl. 24—68 CD **2 Claims**

1. In a ratchet buckle for use in tightening and tensioning strap including a frame member with a pair of oppositely positioned arms, a reel member rotatably supported between

said arms, a pair of ratchet wheels being rotatably mounted between said arms and fixedly attached to said reel member in spaced apart relationship, and a latching plate slidably mounted between said arms for latching said ratchet wheels when they are not being rotatably driven, the strap being wound around said reel member; and a lever member having a pair of oppositely positioned arms rotatably mounted on the reel member and a ratchet drive plate slidably mounted between the lever member arms which engages and drives said ratchet wheel when the lever member is actuated, the improvement being means for securing the latching plate in position firmly against the teeth of said ratchet wheels when the lever member is in a predetermined finally closed position relative to the frame member, comprising:

undercut portions forming latching surfaces in the outer edge portions of said latching plate, said surfaces facing in



a direction substantially opposite to that in which the latching plate extends towards said ratchet wheels, and

projections formed along the inner edges of the lever arms, said projections being positioned directly opposite said latching surfaces and having camming surfaces formed along the outer periphery thereof, said camming surfaces extending at an angle away from the latching surfaces with the lever member in said predetermined finally closed position,

whereby when the lever member is moved towards said predetermined finally closed position the camming surfaces of said projections abut against the latching surfaces to drive the latching plate into firm engagement with the teeth of the ratchet wheels, the latching plate being secured in engagement with said wheels by said projections when the lever member is in said closed position.

4,185,361

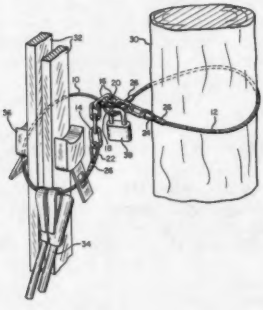
LOCKING DEVICE

Robert B. Stuart, 1608 Crown St., Medford, Oreg. 97501

Filed Apr. 26, 1978, Ser. No. 900,054

Int. Cl.[2] **A44B** *21/00;* **F16L** *33/00*

U.S. Cl. 24—73 SG **1 Claim**



1. A tether comprising,

a first length of flexible cable having

a lock-receiving loop at one free end thereof,

a length of chain comprising a plurality of links connected at one end of its ends to the other end of said first length of cable,

a second length of cable connected at one of its ends to the other end of said length of chain and having a lock-receiving eye at its other free end,

whereby the diameter of the loop formed by either of said cable lengths can be varied by inserting the free end of a cable length through a selected one of said chain links.

4,185,362

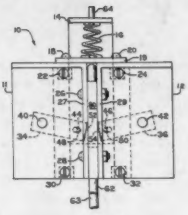
TENSIONING DEVICE

Stephen D. Davis, 309 Mathilda St., Apt. #4, Goleta, Calif. 73017, assignor to Stephen D. Davis and Laddie D. Davis

Continuation-in-part of Ser. No. 807,903, Jun. 20, 1977, abandoned. This application Sep. 29, 1978, Ser. No. 947,268

Int. Cl.[2] **F16G** *11/04, 11/10*

U.S. Cl. 24—134 L **3 Claims**



1. An apparatus for tensioning a pair of lines comprising means for connecting a first of said lines to said apparatus, a boss member for guiding and passing a second of said lines through said apparatus in a first direction, gripping means to prohibit said second line from passing through said apparatus in the opposite direction during tensioning of said lines, said gripping means having gripping surfaces, a pair of stationary walls upon which said grippers are pivotly mounted and a release member upon which said grippers are slideably mounted, said release member being biased by a spring connecting said release member and said stationary walls, said means for connecting said first line to said apparatus being located on said release member, such that upon passing said second line between said grippers in a tensioning direction said grippers allow said second line to pass therethrough and upon passing said second line through said grippers in the opposite direction said grippers pivot with respect to said stationary walls to prohibit said second line from passing therethrough and such that upon activating said release member said release member overcomes the bias of said spring to allow said second line to pass therethrough in the opposite direction to release the tension on said lines.

4,185,363

HANDLE FOR MANIPULATING LEVER

Nicholas F. David, Fullerton, Calif., assignor to H. Koch & Sons Division (Gulf & Western Mfg. Co.), Anaheim, Calif.

Filed Dec. 14, 1978, Ser. No. 969,374

Int. Cl.[2] **A44G** *11/25;* **B64D** *17/30*

U.S. Cl. 24—230 A **10 Claims**

1. A handle for the manipulating lever of a connector member for rocking an interlocking device to selectively release or interlock said connector member with another connector member, comprising

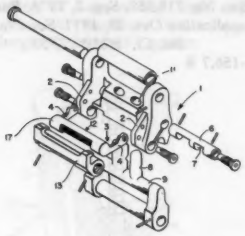
a transverse handle support fixed to said lever,

a locking member axially resiliently held on said support normally urged into locking engagement with an adjacent

part of said connector member thereby resisting movement of said lever relative to said connector member,

a manipulatable handle element on said support manually movable relative to said support,

releasable coacting means between said manipulatable handle element and said locking member normally restraining



the locking member from withdrawing from said interlocking attitude with said connector member, and

means to release said coacting means by manual moving of said handle element thereby freeing said locking member from said connecting member and permitting rocking of said lever.

4,185,364

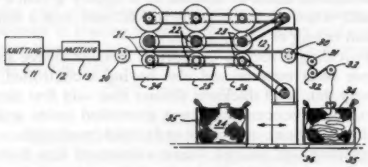
METHOD OF MAKING MULTICOLORED YARN

Roy Luckenbach, Asheboro, N.C., assignor to Roselon Industries, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 884,276, Mar. 7, 1978, abandoned, which is a continuation of Ser. No. 688,630, May 21, 1976, abandoned. This application Mar. 20, 1978, Ser. No. 888,464

Int. Cl.[2] D02G *1/00*; D04B *19/00*

U.S. Cl. 28—218 **23 Claims**



1. In a method of making multicolored yarn, having a multiplicity of short dashes of different colors arranged in succession, the steps which comprise:

knitting said yarn into a tubular prefabric tape,

straightening and flattening said tape,

preheating said tape,

feeding said tape walewise in a straightened and flattened condition and while so feeding said tape, printing at successive upstream and downstream locations spaced walewise along said tape, upon both sides of said tape a multicolor design comprising a multiplicity of individual areas printed with dyes having different colors in the course-wise direction at least about every ½ inch or less, said design also comprising a multiplicity of individual areas having a predetermined length in the wale-wise direction, said multicolor design continuous in both the course-wise and in the wale-wise directions,

overprinting at said downstream location a further color on at least some of said areas previously printed with a different color, in a manner to produce a plurality of additional colors in addition to those previously printed, whereby the resulting multicolor design includes at least five different colors in the course-wise direction, each color applied to said tape having a dimension of about one-half inch or less,

heat setting the resulting printed tape,

deknitting said tape, and

taking up the resulting multicolored yarn.

4,185,365

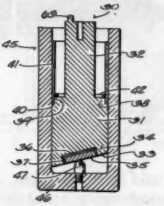
METHOD OF MAKING STATIONARY ANODE X-RAY TUBE WITH BRAZED ANODE ASSEMBLY

Robert E. Hueschen, Hales Corners, and Richard A. Jens, Milwaukee, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 8, 1978, Ser. No. 940,700

Int. Cl.[2] H01J *9/18, 35/08*

U.S. Cl. 29—25.15 **5 Claims**



1. A method of making an anode assembly for a stationary anode x-ray tube comprising the steps of:

providing a cylindrical metal anode body that has a planar end surface which crosses the cylinder axis at an angle, that has a recess in said planar end surface for accommodating an x-ray target element flush with said end surface, that has an annular shoulder axially spaced from said end surface, and that has an electrical connecting member projecting integrally and axially from said body in a direction opposite from said end surface,

assembling a tubular anode support element having opposite open ends and composed of an iron based alloy concentrically onto said body so one end of said tubular element abuts said shoulder,

disposing a ring of copper-and-gold or nickel and gold alloy brazing metal around the joint created between said one end of said tubular element and said body,

setting a tungsten x-ray target element in said recess with a copper-and-gold or nickel and gold alloy foil of brazing metal intervening between said target element and the interior of said recess,

retaining the foregoing assembly in a cup which has a closed bottom, an open top, a bore for receiving said cylindrical body snugly and which has a projection extending from said bottom against which said target element presses, and

raising the temperature of said cup and assembly to between 1000° C. and 1083° C. for sufficient time to melt said ring of brazing metal and said foil and thereby bond said target element and said tubular element to said cylindrical body.

4,185,366

SPINDLE DRIVES FOR MULTI SPINDLE LATHES

Harold J. Gilbert, Coventry, England, assignor to Wickman Machine Tool Sales Ltd., Coventry, England

Continuation of Ser. No. 771,973, Feb. 25, 1977, abandoned, which is a continuation of Ser. No. 528,773, Dec. 2, 1974, abandoned. This application Jul. 21, 1978, Ser. No. 926,752

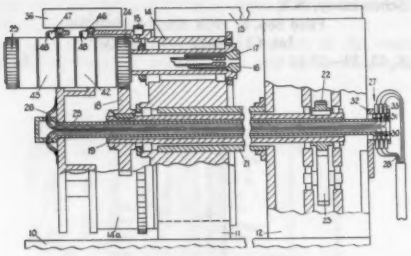
Claims priority, application United Kingdom, Dec. 6, 1973, 56565/73

Int. Cl.[2] B23B *3/18*

U.S. Cl. 29—35.5 **5 Claims**

1. A spindle drive for a multi-spindle lathe having a body, a drum indexible in the body about an axis of a spindle assembly

and a plurality of work spindles rotatably mounted in said drum, said drive having separate drive members for each spindle and electrically operable clutch mechanisms between the respective drive members and spindles, each clutch mechanism comprising a part fixed with respect to the spindle it is to drive and a part fixed with respect to the respective drive member, electromagnetic means fixedly mounted in a ring secured to the drum and indexible with the drum in which the spindles are rotatably mounted, clutch plates carried by said parts respectively and movable by said electromagnetic means to be engaged or disengaged, a source of electrical supply, electrical



wiring connecting said electromagnetic means respectively to said source of electrical supply, a tube through which only said electrical wiring extends, said tube being an innermost element of said spindle and being indexible with said drum and coaxial with the axis about which said drum is indexed, one end of said tube remote from said drum having a rotary, electrical distributor with a portion fixed to the body of the lathe and a portion carried on said tube, said distributor providing electrical connections between said wiring and said source of electrical supply and a hollow drive shaft for said drive members, said drive shaft surrounding said tube.

4,185,367

INTER-ENGAGING UPHOLSTERY BUTTON ANCHORS

David P. W. Puchy, P.O. Box 382, Cheltenham, New South Wales 2119, Australia

Filed Mar. 17, 1978, Ser. No. 887,568
Int. Cl.[2] B68G *7/12, 7/08*
U.S. Cl. 29—91.1 **3 Claims**

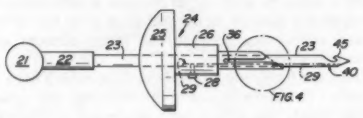


FIG. 4

1. A method of inter-engaging two upholstery fasteners so as to compress a piece of resilient material having two opposite sides, said fasteners each having a body, a shank extending from said body and a head at the free end of said shank, said head having an opening therein adapted to receive the head of a like fastener and being shaped to inter-engage said received head, said method comprising the steps of passing hook means through the opening in the head of one said fastener and through said material so as to position said one fastener adjacent one side of said piece of material and compress said piece of material; maintaining said piece of material compressed while engaging the head of the other fastener with said hook means; moving said hook means back through said material from the other side thereof an through the opening in the head of said one fastener to inter-engage the heads of said fasteners and position the body of said other fastener adjacent said other side; dis-engaging said hook means from the head of said other fastener; and releasing said piece of material from said compression thereby causing the resilience of said material to position said inter-engaged heads within said material and maintain said heads inter-engaged.

4,185,368

METHOD FOR MAKING VALVE GUIDE INSERTS

James A. Kammeraad, Holland, Mich., assignor to K-Line Industries, Inc., Holland, Mich.

Division of Ser. No. 719,958, Sep. 2, 1976, Pat. No. 4,103,662.
This application Oct. 25, 1977, Ser. No. 844,599
Int. Cl.[2] B23P *15/00*
U.S. Cl. 29—156.7 R **18 Claims**

1. A method for forming a multi-layered, high strength metallic, internal combustion engine valve guide insert having high heat transfer qualities, lubricity, and high wear resistance and adapted for later insertion in and lining/relining of a valve guide of an internal combustion engine comprising the steps of:

(1) providing a first cylindrical metallic sleeve having a controlled wall thickness, a controlled concentricity, and controlled inside and outside dimensions, and inside and outside wall surfaces, said first cylindrical sleeve having an outwide diameter adapted to fit tightly within a valve guide when the valve guide is machined with a standard sized boring or reaming tool;

(2) providing a second cylindrical metallic sleeve formed from sheet material and also having a controlled, relatively thin, wall thickness thinner than said first sleeve, a controlled concentricity, and controlled inside and outside dimensions, and inside and outside wall surfaces; and

(3) inserting said second sleeve within said first sleeve by confining said thin walled, second sleeve to a dimension at least equal to the inside dimension of said first sleeve by forcing said second sleeve through while surrounding said second sleeve with an insertion tool and supporting said second sleeve over its entire length with said insertion tool such that the outside wall surface of said second sleeve is maintained at said inner dimension of said first sleeve as said second sleeve is inserted whereby said second sleeve tightly frictionally engages the inside wall surface of said first sleeve after insertion to prevent separation thereof when in use.

4,185,369

METHOD OF MANUFACTURE OF COOLED TURBINE OR COMPRESSOR BUCKETS

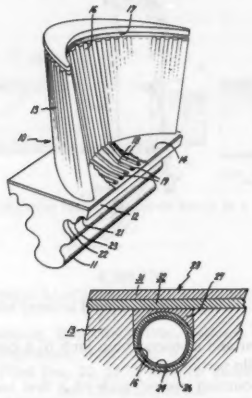
Kenneth A. Darrow, Sprakers, and Gasper Pagnotta, Rexford, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 22, 1978, Ser. No. 889,111
Int. Cl.[2] B23P *15/04*
U.S. Cl. 29—156.8 B **14 Claims**

1. In the method of preparing an airfoil-shaped body in which preformed conduits are arranged in channels recessed in an airfoil core, material is disposed adjacent said preformed

conduits to affix said preformed conduits in place in said channels, and an erosion-corrosion resistant skin is affixed over this initial assembly comprising said airfoil core, said preformed conduits and said material to provide the outer airfoil surface of said body, the improvement comprising the steps of:

preparing a flat bimetallic sheet from separate sheets comprising a first flat sheet of erosion and corrosion resistant material and a second flat sheet of metal selected from the group consisting of copper and high copper-content metal, said previously separate first and second sheets being metallurgically bonded together;



preforming said bimetallic sheet into a closed loop closely matching the outer surface of said initial assembly with a layer of brazing material between said bimetallic sheet and said outer surface;

forcing said closed loop into contact with said initial assembly over substantially the complete inner surface area of said closed loop to form a consolidated assembly; and

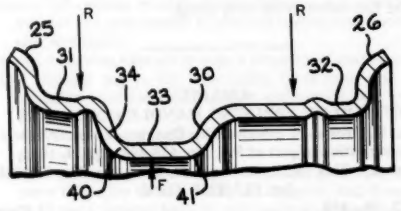
heating said consolidated assembly in a nonoxidizing environment to brazing temperatures to convert said consolidated assembly into a unified structure while maintaining said forcing step.

4,185,370

METHOD OF MAKING A WHEEL RIM

James L. Evans, Ypsilanti, Mich., assignor to Kelsey Hayes Co., Romulus, Mich.

Filed Feb. 10, 1978, Ser. No. 876,773
Int. Cl.[2] B21H *1/10*; B21K *1/38*; B21D *53/30*
U.S. Cl. 29—159.1 **8 Claims**



1. A method of making a wheel rim comprising the steps of:

(a) providing a cylindrical band of material,

(b) deforming a portion of said band material between the lateral edges thereof, radially inward forming a circumferential well depression and imparting a first amount of strain hardening to said well material by such deformation,

(c) squeezing said circumferential well depression between a pair of matched dies thereby coining the well material and further strain hardening said material within said circumferential well depression,

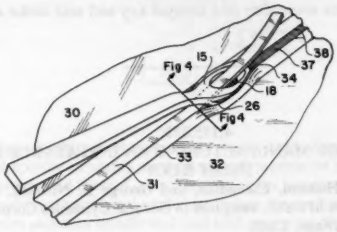
(d) reshaping the well bottom and effecting shrinking of the bead seat areas through coaction of the strain hardened well material and the bead seat area material by forcing said well radially outward while radially restricting the band material on opposite sides of the well.

4,185,371

BEADING INSTALLATION TOOL

Melvin L. Barnett, Box 194, Sonora, Calif. 95370

Filed Jan. 12, 1978, Ser. No. 868,757
Int. Cl.[2] B23P *19/02*
U.S. Cl. 29—235 **6 Claims**



1. A beading installation tool for installing beading in a slot in an elastic molding, said tool comprising:

a head portion of length greater than width, having upper and lower surfaces and being tapered at both the front and rear of the head, said head portion including an indentation of uniformly increasing depth formed in the lower surface between an aperture and the rear of the head, the indentation being deepest adjacent the aperture and being shallowest at the rear of the head, and the indentation not extending widthwise to the sides of the head;

the aperture extending through said head from said upper surface to said lower surface, said aperture being closer to the front at the upper surface than at the lower surface;

a groove formed in the periphery of said head and extending around the front and along the sides thereof, the groove extending rearward on each side of the head at least as far as the rearmost portion of the aperture at the upper surface; and

handle means attached to the head at the rear portion of the upper surface for applying forward and rearward forces thereto.

4,185,372

WHEEL HUB SUPPORT REMOVAL MEANS

Clifford A. Dupree, and Charles Entz, both of Rte. 1, Box 3, Holly, Colo. 81047

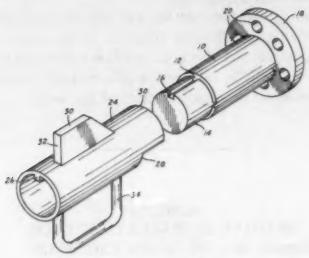
Filed Oct. 26, 1978, Ser. No. 955,000
Int. Cl.[2] B25B *27/14*
U.S. Cl. 29—275 **6 Claims**

1. A tapered sleeve removing tool for sleeves having a key mounted on an axle having a keyway comprising:

(a) a tubular member having at least one 90° cut end;

(b) a cut away portion from said 90° cut end leaving about a hemicircular strike area;

(c) a key mounted internally of the tubular member generally at the mid point of the strike surface, and,



(d) impact means mounted on said tubular member for receiving the blows of an impact member and transmitting the force thereof to said internal key and said strike area.

4,185,373

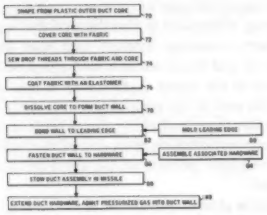
METHOD OF MANUFACTURING AN INFLATABLE AIR INLET DUCT

Charles L. Holland, Escondido, and George B. Nicoloff, San Diego, both of Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Division of Ser. No. 845,172, Oct. 25, 1977, Pat. No. 4,121,606. This application Jul. 5, 1978, Ser. No. 922,248

Int. Cl.[2] **B64D** *33/02*

U.S. Cl. 29—423 **3 Claims**


SHAPE FROM PLASTIC OUTER DUCT CORE
COVER CORE WITH FABRIC
SEW DROP THREADS THROUGH FABRIC AND CORE
COAT FABRIC WITH AN ELASTOMER
DISSOLVE CORE TO FORM DUCT WALL
BOND WALL TO LEADING EDGE
MOLD LEADING EDGE
FASTEN DUCT WALL TO HARDWARE
ASSEMBLE ASSOCIATED HARDWARE
STOW DUCT ASSEMBLY IN MISSILE
EXTEND DUCT HARDWARE, ADMIT PRESSURIZED GAS INTO DUCT WALL

1. A method of manufacturing a deployable air inlet duct which comprises the steps of:

forming a core conforming to the interior configuration of an inflatable duct wall;

covering said core with fabric sheets;

sewing a plurality of drop threads through said core and said sheets;

coating said sheets with an elastomeric material;

dissolving away said core with a solvent which does not adversely affect said sheets, threads and coating to produce a wall of spaced sheets;

molding a leading edge from a flexible material;

bonding said sheets to said leading edge; and

installing the resulting inflatable duct in a vehicle.

4,185,374

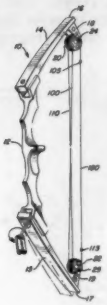
METHOD OF STRINGING A TWO WHEEL COMPOUND ARCHERY BOW

Paul E. Shepley, Rte. 1, Mahomet, Ill. 61853

Division of Ser. No. 742,413, Nov. 17, 1976, Pat. No. 4,078,538. This application Mar. 9, 1978, Ser. No. 884,978

Int. Cl.[2] **F41B** *5/00*

U.S. Cl. 29—434 **5 Claims**



1. A method of stringing a compound archery bow, comprising the steps of:

- joining a first and a second bow limb to a centrally positioned handle section,
- pivotally mounting one of each of a first and a second pulley on the outer end of a corresponding bow limb through an eccentric axis of the pulley,
- providing a first and a second cable for holding a bow string in a tensioned condition along a central stretch of the bow,
- mounting a preswedged off-end of the first cable on a first pin for supporting the first pulley,
- extending the first cable to the second pulley,
- wrapping the first cable in a grooved section of a central circumferential surface of the second pulley and stringing the first cable in a slot on one side wall of the second pulley and passing the end of the first cable through a central aperture of the second pulley until a mount chip is directly adjacent a stepped section of another slot positioned on the other side wall of the second pulley,
- stringing the cable into the slot of the other side and inserting the mount chip into the stepped section,
- wrapping the remaining length of cable which is predetermined by the positioning of the mount chip along the cable in another grooved section of the central circumferential surface of the second pulley and attaching the end of the first cable to the bow string.

4,185,375

METHOD OF APPLYING HANDLE COVERINGS

Horace R. Brown, 12 Frandon Dr., Danbury, Conn. 06810

Continuation-in-part of Ser. No. 675,488, Apr. 9, 1976, abandoned. This application Aug. 24, 1977, Ser. No. 827,225

Int. Cl.[2] **B23P** *11/02*

U.S. Cl. 29—450 **1 Claim**

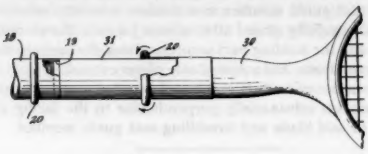
1. A method for applying elastomeric material in tubular form as a handle cover comprising the steps of

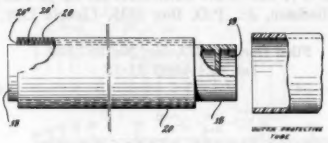
positioning one tube of rollable elastomeric material about a support core coaxially therewith and successively placing one or more additional tubes about each such tube last so positioned,

rolling one of said tubes into a grommet-like ring,

rolling said tube while rolled up into a grommet-like ring

from said support core onto and along the outer surface of a handle to a desired position on said handle, and





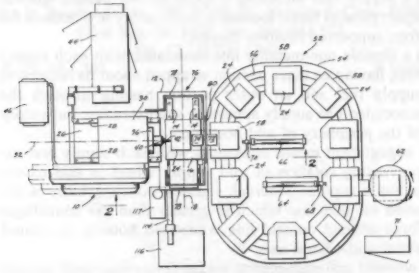
unrolling said tube into position to serve as a cover for said handle.

4,185,376

UNMANNED MACHINING CENTER WITH TOOL CHECKING

Richard Johnstone, Brookfield, Wis., assignor to Kearney & Trecker Corporation, West Allis, Wis.

Filed Dec. 22, 1977, Ser. No. 863,435
Int. Cl.[2] B23Q *3/157*
U.S. Cl. 29—568 **7 Claims**



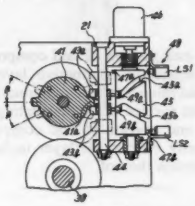
1. An unmanned machining center comprising:
a workpiece support adapted to support a workpiece;
a spindle adapted to hold a cutting tool and to rotate said cutting tool;
means for causing relative motion between said workpiece support and said spindle to perform cutting operations on said workpiece;
a tool magazine adapted to hole a plurality of cutting tools;
tool changer means for transferring tools from said tool magazine to said spindle and from said spindle back to said tool magazine;
a workpiece magazine adapted to hold a plurality of workpieces;
shuttle means for transferring workpieces from said workpiece magazine to said workpiece support, and from said workpiece support back to said workpiece magazine;
means for counting the number of teeth on a tool in said spindle;
means for comparing the counted number of teeth to a recorded number which signifies the number of teeth that should be on the tool; and
means for automatically replacing a broken or incorrect tool with another tool of the same type from said tool magazine.

4,185,377

MACHINE TOOL WITH AN AUTOMATIC TOOL EXCHANGER

Tohru Nakaso, Nagoya; Manabu Hosokawa, Chiryu; Kenzi Nomura, Aichi, and Tatsuya Hikosaka, Toyohashi, all of Japan, assignors to Toyoda Machine Works, Ltd., Aichi, Japan

Continuation of Ser. No. 755,574, Dec. 29, 1976, Pat. No. 4,091,526. This application Apr. 19, 1978, Ser. No. 897,845
Claims priority, application Japan, Jan. 29, 1976, 51/9029
The portion of the term of this patent subsequent to May 30, 1995, has been disclaimed.
Int. Cl.[2] B23Q *3/157*
U.S. Cl. 29—568 **8 Claims**



1. In a machine tool with an automatic tool changer having a tool spindle rotatably supported and capable of receiving a tool at one end thereof, a tool magazine for removably storing a plurality of tools, and exchange means for exchanging tools between said tool spindle and said tool magazine, the improvement comprising:
a key provided on one of said tool spindle and each of said tools for drive engagement with a key-way provided on the other of said tool spindle and each of said tools, said key and said key-way being so sized as to establish in their rotational direction a predetermined play permitting a substantial relative rotation therebetween when engaged with each other;
a plurality of means provided on said tool magazine in the same angular relationship with one another and each engageable with one of said key and said key-way provided on each of said tools, each of said means having almost the same width as that of one of said key and said key-way provided on said tool spindle in the rotational direction of each tool; and
fine indexing cam means for indexing said tool spindle to a predetermined angular position after a machining operation and further for indexing said tool spindle from said predetermined angular position through at least an angular distance after a fresh tool selected from said tools is inserted by said exchange means into said tool spindle, so as to bring about a positive drive engagement between said key and said key-way provided on said tool spindle and said fresh tool.

4,185,378

METHOD FOR ATTACHING COMPONENT LEADS TO PRINTED CIRCUIT BASE BOARDS AND PRINTED CIRCUIT BASE BOARD ADVANTAGEOUSLY USED FOR WORKING SAID METHOD

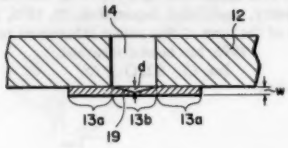
Hideo Machida, Saitama, Japan, assignor to Chuo Meiban Mfg. Co., LTD., Saitama, Japan

Filed Feb. 10, 1978, Ser. No. 877,555
Int. Cl.[2] H05K *3/04*
U.S. Cl. 29—626 **7 Claims**

1. A method for attaching component leads to a printed circuit board having an insulating substrate having first and second opposed surfaces and a thin electrically conductive layer on said first surface of said insulating substrate comprising the steps of:

drilling a hole from said second surface of said insulating substrate completely through said insulating substrate and partially into said thin electrically conductive layer leaving a portion of said thin electrically conductive layer to cover said hole formed thereby;

inserting a component lead into said hole in said insulating substrate from said second surface thereof;



projecting the end portion of said component lead through said thin electrically conductive layer to deform said portion of said thin electrically conductive layer outwards from said first surface of said insulating substrate; and

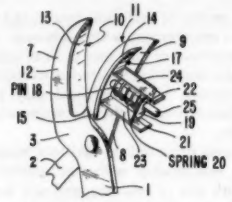
soldering said end portion of said component lead to said thin electrically conductive layer including at least said deformed portion thereof.

4,185,379

ROSE AND SHRUBBERY TRIMMER

Willis J. Amstutz, 307 E. Monroe St., Pandora, Ohio 45877

Filed Jul. 14, 1978, Ser. No. 924,735
Int. Cl.[2] B26B *13/00*
U.S. Cl. 30—134 **1 Claim**



1. A rose and shrubbery trimmer, comprising

pruning shears having first and second handle members each having spaced opposite first and second ends, said handle members being pivotally affixed to each other in the area of the first ends thereof, a holding member extending from the first end of the first handle member, and a blade extending from the first end of the second handle member, said holding member and said blade having substantially planar facing surfaces facing each other, a cutting edge on the facing surface of said blade and spaced opposite backing surfaces on the sides opposite said facing surfaces, said holding member having a blunt corner;

a holding part affixed to the holding member and extending substantially perpendicularly from the backing surface of the holding member along the blunt corner edge thereof; and

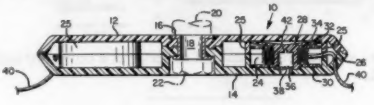
a clamping part slidably mounted on the facing surface of the blade for movement in directions toward and away from the cutting edge of said blade and extending substantially perpendicularly from said facing surface, said clamping part comprising a clamping part member having substantially the same configuration as the holding part and having a front surface facing said holding part and an opposite rear surface, a pin extending substantially perpendicularly from said rear surface, a guide member consisting of a substantially right-angled angle member affixed to the facing surface of the blade and having a part extending substantially perpendicularly to said facing surface with a hole formed therethrough slidably accommodating said pin and a spring mounted on said pin in said guide member and abutting said clamping part member and said guide member in a manner whereby when the shears are fully closed after severing a stem the clamping part and the holding part securely clamp the severed stem between them, and a pair of side plates extending from the rear surface of said clamping part member in spaced parallel relation substantially perpendicular to the facing surface of said blade and straddling said guide member.

4,185,380

FLEXIBLE LINE ROTARY VEGETATION CUTTER HAVING A TENSION REGULATED LINE FEED

Jack W. Hindman, Jr., P.O. Box 2335, Lincoln City, Oreg. 97367

Filed Dec. 5, 1977, Ser. No. 857,598
Int. Cl.[2] A01D *55/18*
U.S. Cl. 30—347 **3 Claims**



1. A flexible line rotary vegetation cutter having a tension regulated line feed comprising:

(a) a housing having at least one reel receiving cavity located therein and rotatable about a central axis;

(b) said housing having a line supply aperture associated with each reel receiving cavity, opening between its respective cavity and the periphery of said housing;

(c) a supply reel including a spool having paired, spaced-apart parallel faces, located in each cavity in a manner for free, supported rotation therein;

(d) a flexible non-metallic line associated with each supply reel, having an inner portion wrapped about its respective supply reel and an outer portion passing through the associated line supply apperture and extending outwardly of the periphery of said housing;

(e) engagement means associated with each supply reel for preventing rotation of said supply wheel in said cavity unless a manual, external, radially outward force is exerted on said line which is greater than the centrifugal force created on said line when said housing is rotated about said central axis;

(f) wherein said engagement means comprises; teeth located on one of said faces, notches located in said cavity in a manner to engage said teeth when said supply reel is positioned in said cavity and urged toward said notches so as to resist rotation of said supply wheel in said cavity, spring biasing means associated with the other face of said supply reel for normally urging said teeth toward said notches, and said teeth and said notches including mating ramps so that forced rotation of said supply reel causes said teeth to be raised with respect to said notches by compressing said spring biasing means.

4,185,381

ROTARY NYLON LINE VEGETATION CUTTER

Vincent A. Palmieri, and John P. Palmieri, both of 3745 El Camino Dr., San Bernardino, Calif. 92410

Filed Jul. 17, 1978, Ser. No. 925,045
Int. Cl.[2] A01D *55/18;* **A01G** *3/06*
U.S. Cl. 30—347 **3 Claims**

1. In a flexible line whirling vegetation cutting hand tool, a rotary head for which is provided to be supported on and manipulated by the lower end of a relatively long handle equipped with power means for rapidly spinning said head on a vertical axis, the improvement comprising the following subcombination of elements:

a pair of like hollow circular housing halves abutting in face-to-face relation to provide a cylindrical housing for said rotary head, said housing halves having co-axially apertured hubs said apertures including polygonal internal wrench configurations;

a polygonal arbor opposite end portions of which snuggly fit into said wrench configurations to prevent relative rotation between said housing halves, said arbor having threaded means of reduced diameter extending axially at its opposite ends through said co-axial apertures to receive nut means for snugly assembling said housing halves on said arbor; and

drive means connecting the upper end of said arbor to said power means.

4,185,382

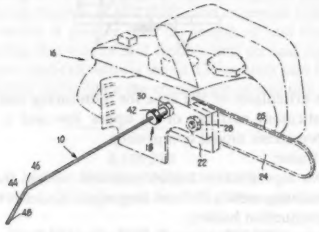
'CHAIN SAW GAUGING ATTACHMENT

John P. Rawlinson, Jr., 300 Booth St., Stratford, Conn. 06497

Filed Sep. 18, 1978, Ser. No. 943,532

Int. Cl.[2] B27B *17/02*

U.S. Cl. 30—383 **6 Claims**



1. A length-of-cut gauging attachment for chain saws, comprising in combination:

(a) an elongate, slender gauge rod adapted to extend along a piece of wood or log which is to be cut across its length,

(b) a quick-attachment fitting for securing said gauge rod to the frame work of the chain saw,

(c) said fitting having a hollow hub adapted to receive one end of the gauge rod, and having means engageable with said rod end to firmly secure the same to the fitting,

(d) said fitting having a threaded bore disposed substantially in alignment with the hub, said threaded bore being adapted to be screwed onto an existing protruding threaded stud of the chain saw frame, and

(e) said fitting having means enabling it to be manually turned and screwed tightly on said stud whereby the gauge rod extends laterally from the saw frame and chain track thereof, thus enabling a user when making a cut with the saw to dispose the gauge rod along the work for the purpose of sighting the place at which the next cut is to be made.

4,185,383

DENTAL IMPLANT HAVING A BIOCOMPATIBLE SURFACE

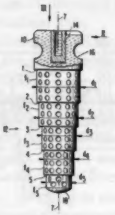
Günther Heimke, Weinheim, and Willi Schulte, Tübingen, both of Fed. Rep. of Germany, assignors to Friedrichsfeld GmbH. Steinzeug-und Kunststoffwerke, Mannheim, Fed. Rep. of Germany

Filed Apr. 29, 1977, Ser. No. 792,116

Claims priority, application Fed. Rep. of Germany, May 4, 1976, 2619650

Int. Cl.[2] A61C *8/00*

U.S. Cl. 433—173 **23 Claims**



1. Dental implant comprising an elongated body provided with a surface composed of biocompatible material, the upper end of said body including a head provided with means of anchoring a superstructure to be supported by said implant, a shaft extending downwardly from the head, the exterior periphery of said shaft having stepped surfaces generally perpendicular to the axis of the shaft and of progressively decreasing mean diameter and successive peripheral surfaces of the shaft also having progressively decreasing cross-sections as the lower end of the shaft is approached, the cross-section at the upper end of each peripheral surface being at least equal to the cross-section at the lower end of the same peripheral surface, and the cross-section of each peripheral surface at its lower end being larger than the cross-section of the next lower peripheral surface, the difference between the last two mentioned cross-sections defining the adjacent stepped surface, whereby all of the stepped surfaces may lie in abutting contact with load-bearing bone tissue immediately upon implanatation.

4,185,384

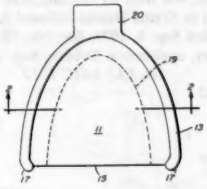
DENTAL ADJUSTMENT DEVICES

Leopold P. Lustig, 304 Greenwood St., Newton Centre, Mass. 02159, and Elizabeth A. Bishop, Boston, Mass., assignors to Leopold P. Lustig, Newton Centre, Mass.

Filed Sep. 12, 1977, Ser. No. 832,531

Int. Cl.[2] A61C *9/00*

U.S. Cl. 433—70 **11 Claims**



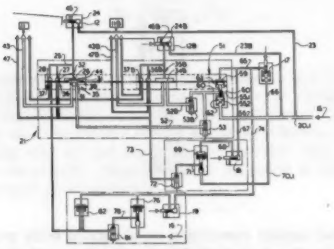
11. A unitary article of manufacture comprising a tooth-marking dental articulating film as little as 15 microns thick with a frame continuously attached to only a major portion of its periphery, a minor portion of the periphery of said film being unframed, said frame being flexible and stiffer than the film for providing flexible peripheral support to the film and holding the film taut in the frame and at the unframed portion

of said periphery, so as to permit said film to conform with occlusal or contact surfaces of teeth being marked.

4,185,385
CONTROL SYSTEM FOR DENTAL DRILLS

Anton A. Simor, North Vancouver, Canada, assignor to Dental-ez of Canada Ltd., North Vancouver, Canada

Filed Nov. 11, 1977, Ser. No. 850,632
Claims priority, application United Kingdom, Jan. 6, 1977, 449/77
Int. Cl.² A61C *19/02*
U.S. Cl. 32—22 **3 Claims**



1. A control assembly for controlling flow of operating air from a source of pressurized air and coolant fluid from a source of pressurized coolant to a pneumatically driven dental hand tool of dental drilling apparatus comprising:

(a) first conduit means for delivery operating air from the pressurized air source to the hand piece,

(b) second conduit means for delivering pressurized coolant fluid from the pressurized fluid source to the hand piece,

(c) a pilot valve in each of the conduit means for controlling passage of operating air and coolant fluid there-through,

(d) each pilot valve having:

(i) a closure element spring-urged to a normal closed position,

(ii) a closed chamber,

(iii) a valve operator in the closed chamber for moving the closure element to an open position upon application of air at selected pilot pressure to the chamber,

(e) a pilot air conduit means between the source of pressurized air and the chamber of each pilot valve,

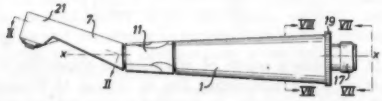
(f) a foot-operated valve in said pilot air conduit means for controlling delivery of pilot air to the pilot valves,

(g) said pilot valves being arranged to open at the same selected pilot pressure so as to enable concurrent delivery of coolant fluid and operating air to the hand piece.

4,185,386
HOLDER FOR TURBINE-DRIVEN DENTAL DRILL

Elling H. Nordin, and Karl O. Sjoman, both of Enköping, Sweden, assignors to Svedia Dental-Industri Aktiebolag, Sweden

Filed Sep. 9, 1976, Ser. No. 721,785
Claims priority, application Sweden, Sep. 19, 1975, 7510533
Int. Cl.² A61C *1/12*
U.S. Cl. 433—82 **4 Claims**

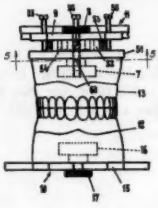


1. A holder for a turbine-driven dental tool comprising an elonated shank, said shank having means for connection to a working fluid source for driving a turbine and to a source of cooling fluid for flow axially in said shank, a mounting pin on an end of said shank and having an axial bore on an end thereof, a finger-grip sleeve circumferentially of said mounting pin relatively rotatable thereto and extending axially from said end of said mounting pin, said sleeve having deformable internal axial splines, an exchangeable anglepiece removably mounted on said shank, said anglepiece having a coupling pin in said bore for non-rotation therein with resistance for holding the anglepiece in a set angular position, said coupling pin having axial splines received in said finger-grip sleeve and complementary with the splines on said finger-grip sleeve, and said deformable splines being deformable for allowing rotation of the splined coupling pin incremently in said finger-grip sleeve and thereby allowing positioning said anglepiece at set angular positions upon manual rotation of said shank while said fingergrip sleeve is held manually angularly stationary.

4,185,387
DENTAL ARTICULATOR

Roland Weber, 5 Grande-chêne, Lausanne, Switzerland

Filed Jun. 16, 1977, Ser. No. 807,238
Claims priority, application Switzerland, Oct. 21, 1976, 13299/76
Int. Cl.² A61C *11/00*
U.S. Cl. 433—61 **2 Claims**



1. An articulator of the type for monitoring and correcting the masticatory surfaces of an upper jaw and a lower jaw dental prosthesis model comprising:

(a) a frame;

(b) two reproduction bodies mounted on said frame;

(c) mounting means for attaching a jaw model to each of said reproduction bodies;

(d) articulation means connected to said reproduction bodies for moving said bodies in relation to each other to copy the articulative movements of a patient;

(e) occlusion compensation means connected to at least one of said reproduction bodies for providing three-dimensional adjustment of a jaw model in relation to said reproduction body when said jaw is attached to said reproduction body, said compensation means including a compensation plate attached to one of said reproduction bodies;

(f) a base plate attached to one of said reproduction bodies;

(g) a centering ring attached to said compensation plate and having a plurality of threaded bores therein located about a horizontal plane of said ring;

(h) a centering tube attached to said base plate and disposed within said centering ring with the longitudinal axis of said tube being perpendicular to, and projecting into, the horizontal plane defined by said bores; and

(i) a plurality of centering screws threaded through said bores, one end of each of said screws abutting said centering tube so that the axis of said tube may be adjusted with respect to the axis of said ring upon reciprocation of said screws within their respective threaded bores.

4,185,388

HONING AND POLISHING INSTRUMENT ESPECIALLY INTENDED FOR DENTAL USE

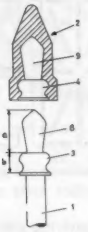
Sven Jarby, Niels Hemmingsensgade 8, Copenhagen, Denmark

Filed Sep. 21, 1977, Ser. No. 835,309

Claims priority, application Switzerland, Jun. 17, 1977, 8249/77

Int. Cl.[2] A61C *3/06;* **B24D** *17/00*

U.S. Cl. 433—125 **2 Claims**



1. A rotatable honing and polishing instrument comprising;

a rotatable shaft;

connection means formed at one end of said shaft for connecting and supporting a flexible honing and polishing unit on said shaft, said connecting means including a flange of circular cross section coupled to said shaft, and a thin flat elongated extension of a generally trapezoidal cross section shape coupled to said flange, and

a replaceable honing and polishing unit of flexible abrasive material, said unit having a hollow internal portion including a bore shaped to fit over said extension and an indent shaped to fit over said flange, the generally trapezoidal cross section shape of said bore and said flat extension thereby limiting lateral flexing of the honing and polishing unit during use and slippage of said honing and polishing unit during rotation of said shaft, said extension being of a length which is greater than the length of said flange so that during insertion of said flexible unit on said connecting means, said extension is the first to contact said flexible unit thereby to facilitate the connection of said unit to said shaft.

4,185,389

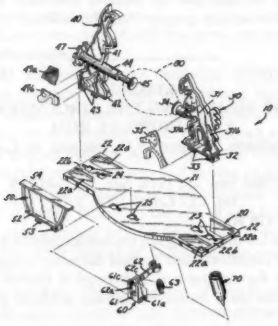
EGG DECORATING DEVICE

Stanley J. Fudro, 2322 Second St. NE., Minneapolis, Minn. 55418

Filed Mar. 24, 1978, Ser. No. 889,917

Int. Cl.[2] B43L *13/00*

U.S. Cl. 33—21 R **15 Claims**



1. An egg decorating device, comprising:

(a) a substantially flat base;

(b) egg holding means carried by the case for releasably holding an egg for rotation about a longitudinal axis comprising

(i) first and second upright standards disposed in opposed, spaced relation;

(ii) an egg receiving member carried by each standard for rotation about said longitudinal axis, each member constructed to receive one end of an egg; and

(iii) one of said egg receiving members being mounted for retractable movement relative to the other on said longitudinal axis to permit entry of an egg therebetween;

(c) an upright track support disposed on the base in spaced relation to the longitudinal axis;

(d) an elongated track member defining first and second free ends and carried by the track support in substantial alignment with the longitudinal axis;

(e) bayonet means for interlockably and releasably connecting each of said first and second upright standards and said upright track support to the flat base, the bayonet means for the first and second upright standards being so constructed that said standards are interlocked with the base when they are urged away from each other and released when urged toward each other;

(f) a track following member constructed to be manually moved longitudinally along the track means;

an arm member pivotally carried by the track following member for swinging movement toward and away from an egg carried by the egg holding means, the arm member including means for carrying an egg marking device;

(g) biasing means for urging the arm member into engagement with an egg mounted in the egg holding means; and

(h) the track member and track following member having interlocking means so that the track following member can be slidably mounted thereon or removed from either of said first and second free ends, and to permit said longitudinal sliding movement while resisting forces acting on the track following member as the egg is marked.

4,185,390

ELECTRONIC TAPE MEASURE WITH COMPARISON CAPABILITIES

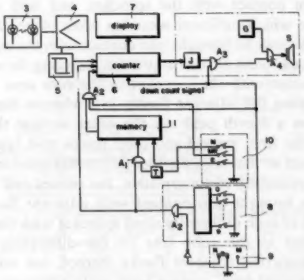
Iwao Tateishi, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 23, 1977, Ser. No. 854,210

Claims priority, application Japan, Nov. 30, 1976, 51-162396[U]

Int. Cl.[2] G01B *3/12*

U.S. Cl. 33—139 **13 Claims**



1. An electronic tape measure enclosed within a housing and having a tape extendible and retractible therefrom, said housing having a calculator keyboard thereon, comprising:

storing means for introducing and storing a predetermined specific quantity information into said tape measure via

said keyboard, said storing means generating an output signal indicative of said predetermined specific quantity information, said specific quantity information being indicative of the length of an object to be measured;

sensing means for sensing the length of said tape when pulled out from said housing, said sensing means generating a counting signal indicative of said length;

coincidence detecting means, responsive to said output signal and said counting signal, for detecting the coincidence between said predetermined specific quantity information and the length of said tape when pulled out from said housing; and

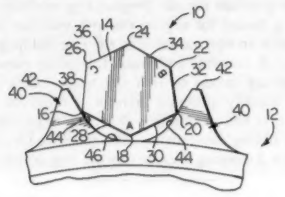
alarm means responsive to said coincidence between said predetermined specific quantity information and said length of said tape when pulled out from said housing, for generating an alarm signal.

4,185,391

SPROCKET WEAR TEMPLATE

Robert D. Roley, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 29, 1976, Ser. No. 745,742
Int. Cl.[2] G01B *3/30*
U.S. Cl. 33—168 R **9 Claims**



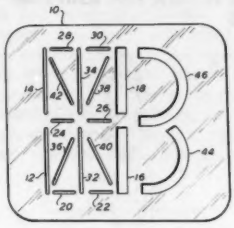
1. Apparatus for gauging the wear of a toothed sprocket, said apparatus comprising a body defining first, second and third spaced peaks on the outer surface thereof, said apparatus being positioned so that with such a sprocket in a relatively less worn state, the first and third peaks may be brought into contact with adjacent flanks of adjacent teeth of a sprocket with the second peak positioned in the root area of the sprocket between the adjacent flanks, but with the second peak removed from contact with the sprocket, and with such a sprocket upon which sufficient wear has taken place, the first and third peaks may be brought into contact with the adjacent flanks of adjacent teeth of such a sprocket, bringing the second peak into contact with the sprocket in the root area of the sprocket between the adjacent flanks, and wherein the body further defines a fourth peak on the outer surface thereof, spaced from the first, second and third peaks, said apparatus being positioned so that with another differently sized toothed sprocket in a relatively less worn state, the second and fourth peaks may be brought into contact with adjacent flanks of adjacent teeth of such differently sized sprocket with the third peak positioned in the root area of the differently sized sprocket between the adjacent flanks thereof, but with the third peak removed from contact with such differently sized sprocket, and with such a differently sized sprocket upon which sufficient wear has taken place, the second and fourth peaks may be brought into contact with adjacent flanks of adjacent teeth of such differently sized sprocket, bringing the third peak into contact with the differently sized sprocket in the root area thereof between the adjacent flanks thereof.

4,185,392

LETTERING TEMPLATE

Samuel Berkman, Florham Park, N.J., assignor to BST Associates, Florham Park, N.J.

Filed Apr. 21, 1978, Ser. No. 898,651
Int. Cl.[2] B43L *13/20*
U.S. Cl. 33—174 B **5 Claims**



1. An alphanumeric lettering guide comprising:

A planar substrate having a plurality of slots therein, said plurality arranged with a first pair of slots linearly disposed along a first course, a second pair of slots linearly disposed along a second course parallel to said first course, a third pair of linearly disposed slots disposed along a third course having a first end adjacent a first end of said first pair of slots and a second end adjacent a first end of said second pair of slots, a fourth pair of linearly disposed slots substantially parallel to said third pair of slots having a first end disposed in close, non-touching relationship to adjacent ends of ones of said first pair of slots and a second end disposed in close, non-touching relationship to adjacent ends of ones of said second pair of slots, a fifth pair of linearly disposed slots substantially parallel to said third pair of slots having a first end disposed adjacent to a second end of said first pair of slots and a second end disposed adjacent a second end of said second pair of slots, a sixth pair of slots linearly disposed along a course having a first end adjacent a first end of said first pair of slots and a second end adjacent a second end of said second pair of slots, a seventh pair of slots linearly disposed along a course having a first end adjacent a second end of said first pair of slots and a second end adjacent a first end of said second pair of slots, a first non-linear slot having a first end adjacent a second end of said second pair of slots and a second end aligned with said fourth pair of slots in close non-touching relationship to adjacent ones of said second pair of slots, a second non-linear slot having a first end adjacent said first end of said second pair of slots and a second end adjacent said first non-linear slot, said first and second non-linear slots and said second pair of linearly disposed slots having width substantially greater than the width of others of said slots.

4,185,393

DEVICE FOR MEASURING THE CIRCUMFERENCE OF A CYLINDRICAL ROD

Donald A. Calleson, Durham, N.C., assignor to Liggett Group Inc.

Filed Sep. 25, 1978, Ser. No. 945,759
Int. Cl.[2] G01B *5/00, 5/08*
U.S. Cl. 33—178 R **13 Claims**

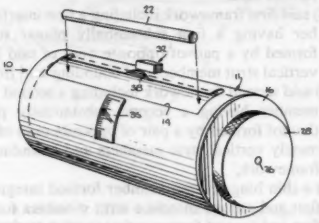
1. A device for measuring the circumference of a cylindrical rod having a predetermined normal diameter comprising

first means for rolling a rod through a known number of revolutions on a measured surface without slippage, including

a pair of concentric cylinders with a selected one of said cylinders having disposed thereon a measured surface,

said concentric cylinders defining an annular gap for rolling said rod therebetween;

second means for placing an index mark on the rod at an initial point of said measured surface; and



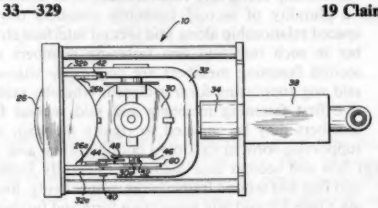
third means for indicating the position of the index mark on said measured surface after rolling of the rod on said measured surface.

4,185,394

SPHERICAL DISPLAY FOR ARTIFICIAL HORIZON INDICATOR

James R. Younkin, Edo-Aire Mitchell, 1500 S. Old Missouri Rd., Springdale, Ark. 72764

Filed Apr. 10, 1978, Ser. No. 895,250
Int. Cl.[2] G01C *19/34*
U.S. Cl. 33—329 **19 Claims**



1. A horizon reference indicator for providing an artificial indication of an aircraft attitude, comprising in combination:

a frame having side members,

a roll indicator attached to said frame at one end thereof to rotate therewith,

an attitude reference source mounted within said frame between the side members thereof and having a drive output displaced from said roll indicator, said attitude reference source responding to the aircraft attitude,

a horizon display position approximate the roll indicator to move in relationship thereto and having an arm extending therefrom in the direction of said reference source,

means for pivotally mounting the arm of said horizon display to one side member of said frame at a point located between the drive output of said reference source and said roll indicator, and

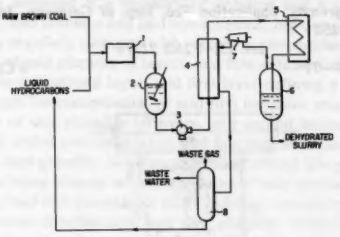
means for coupling the movement of said frame relative to said reference source to said horizon display to produce movement thereof about said means for pivotally mounting.

4,185,395

METHOD FOR THERMAL DEHYDRATION OF BROWN COAL

Yukio Nakako, Takarazuka; Kenjiro Motonaga, Kobe; Junichiro Nada, Kobe; Toshio Ohzawa, Kobe; Shizuo Yokota, Nishinomiya, and Haruo Kakunai, Akashi, all of Japan, assignors to Kobe Steel, Limited, Kobe, Japan

Filed Mar. 10, 1978, Ser. No. 885,125
Claims priority, application Japan, Mar. 12, 1977, 52/27214; Mar. 12, 1977, 52/27215; Apr. 8, 1977, 52/40541
Int. Cl.[2] F26B *7/00*
U.S. Cl. 34—12 **12 Claims**



1. A method for thermal dehydration of brown coal in a system including mixing means, a heat exchanger, a heating member, and gas-liquid separator means which comprises:

admixing raw brown coal with liquid hydrocarbon in said mixing means to prepare a slurry,

passing the slurry through said heat exchanger to preheat the same, and directly to said heating member,

heating the slurry in said heating member to a temperature in the range of 100° to 300° C.,

subjecting the heated slurry to gas-liquid separation in said separator to fractionate said heated slurry into a steam-containing vapor and a dehydrated slurry,

recovering the dehydrated slurry, and

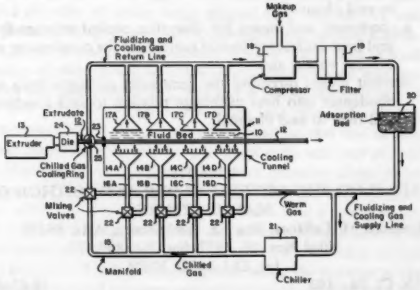
recycling said steam-containing vapor to said heat exchanger as a heating medium for preheating the slurry.

4,185,396

APPARATUS FOR COOLING RUBBER AND PLASTIC EXTRUDATES

Alan S. Haisser, Flemington, N.J., assignor to Sterling Extruder Corporation, South Plainfield, N.J.

Filed Feb. 1, 1978, Ser. No. 874,210
Int. Cl.[2] F26B *17/00*
U.S. Cl. 34—57 R **9 Claims**



1. Apparatus for cooling rubber and plastic extrudates comprising:

tunnel means through which extrudate from an extruder passes;

disposed in said tunnel means, a fluidizable bed of small, solid particles;

means for fluidizing said bed with chilled gas at a sufficiently low temperature as to cool the extrudate and at a sufficient pressure that the fluidized bed supports the passing extrudate away from the walls of said tunnel.

4,185,397

ARRANGEMENT FOR THE DRYING OF SOLVENT AT A DRYING CHANNEL

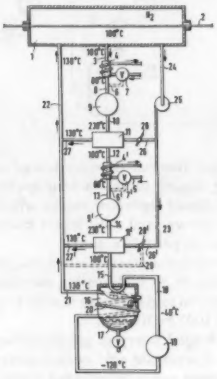
Armin S. P. Hutzenlaub, Am Stichelberg 24, 5276 Wiehl-1, Fed. Rep. of Germany

Filed Jun. 2, 1978, Ser. No. 912,014

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1977, 2725252

Int. Cl.[2] F26B *21/14*

U.S. Cl. 34—77 **6 Claims**



1. An arrangement for the recovery of solvents from a solvent carrier medium wherein the solvent and carrier medium mixture is compressed, the solvent is condensed, the medium is expanded and reduced in temperature to be used as a coolant, the arrangment comprising:

a drying channel containing said mixture, the carrier medium being nitrogen;

a compressor and means for directing said mixture of solvent and nitrogen from said channel to said compressor;

a heat exchanger and means for directing compressed mixture from said compressor to said heat exchanger and then to said channel;

means for directing nitrogen from said channel to said heat exchanger for cooling said compressed mixture and then to said channel;

a condenser and means for directing cooled mixture from said heat exchanger to said condenser for condensing said solvent vapor; and

conduit means directing the remaining nitrogen from said condenser into heat exchange relation to said condenser and then to said channel.

4,185,398

AIR-FLOW WIG DRYER/HOLDER AND METHOD OF MANUFACTURE

Romanus M. LaMont, Box F3, Wickenburg, Ariz. 85358

Filed Nov. 10, 1977, Ser. No. 850,277

Int. Cl.[2] A45D *20/24*

U.S. Cl. 34—103 **18 Claims**

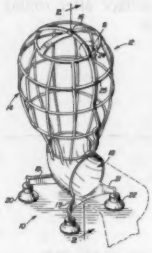
12. A polypropylene wig supporting form comprising in combination:

(a) first and second approximately symmetrical frameworks hinged together to form a unitary body, each of said frameworks including a plurality of approximately horizontal strut members and a plurality of approximately vertical strut members integrally joined together at a plurality of intersections thereof, thereby outlining a shape approximately similar to the shape of half of a human head;

(b) said first framework including a first interface strut member having a first substantially planar surface thereof formed by a pair of opposite ones of said approximately vertical strut members and bounding said first framework;

(c) said second framework including a second interface strut member having a second substantially planar surface thereof formed by a pair of opposite ones of said approximately vertical strut members and bounding said second framework;

(d) a thin hinged strap member formed integrally with said first and second interface strut members for hinging said first and second frameworks together to permit closing of said first and second frameworks so that said first and



second substantially planar surfaces adjoin and are align with said first and second frameworks to outline a shape approximately similar to the shape of a human head;

(e) a plurality of first fastening members disposed in spaced relationship along said first interface strut member;

(f) a plurality of second fastening members disposed in spaced relationship along said second interface strut member in such that said first fastening members and said second fastening members are engagably aligned when said wig supporting form is closed, whereby said respective first fastening members and said second fastening members may be engaged to rigidly maintain said wig supporting form in its closed configuration; and

(g) first and second base members integrally formed with said first and second frameworks, respectively, for providing a base for said wig supporting form and further including suction cups attached to said first and second base members for attaching said polypropylene wig supporting form to a smooth surface.

4,185,399

DOCTOR BLADE, DRYING OR SEALING ASSEMBLY

Herbert E. Gladish, Ottawa, Canada, assignor to E.B. Eddy Forest Products, Ltd., Ottawa, Canada

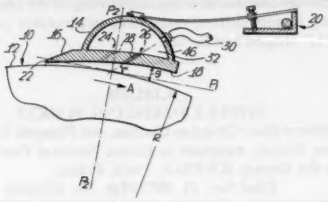
Filed Oct. 2, 1978, Ser. No. 947,436

Int. Cl.[2] F26B *11/02*

U.S. Cl. 34—120 **9 Claims**

1. Apparatus for use in conjunction with a cylinder surface rotatable about an axis comprising a foot portion having an outer surface which substantially conforms to the curvature of the cylinder surface; means for resiliently supporting said apparatus in close juxtaposition to said cylinder surface whereby a gap of thickness diminishing progressively towards one longitudinal edge of said foot portion is formed between said outer surface and said cylinder surface; at least two rows of nozzles communicating through said foot portion to exit therefrom at said outer surface; and a source of pressurized fluid connectible to said nozzles, each of said nozzles having its

axis directed obliquely to three orthogonal planes one of which is parallel to said one edge and another of which is tangent to said cylinder surface at the juncture of the nozzle axis with said



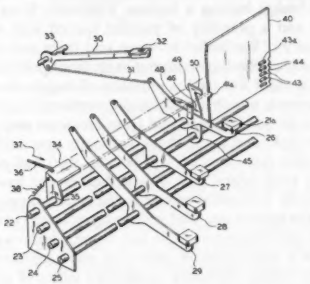
cylinder surface whereby fluid which issues from the nozzles in the row farthest from said one edge will coact with fluid issuing from adjacent nozzles in the same and adjoining rows to create an organized flow of individual fluid streams.

4,185,400

TYPEWRITER WITH INSTRUCTIONAL APPARATUS

Gall, John C., Chicago; Joseph H. Batogowski, Naperville, and Albert F. Chamberlain, Lake Bluff, all of Ill., assignors to Sears, Roebuck and Co., Chicago, Ill.

Filed Aug. 14, 1978, Ser. No. 933,146
Int. Cl.[2] G09B *13/00*
U.S. Cl. 35—5 **12 Claims**



1. An instructional aid device comprising type, type bars supporting said type, key controlled key bars pivotally mounted on at least one rod and operatively connected to said type bars, control means for controlling the actuation of the type bars in accordance with coded information contained therein, and sensing means mounted on said one rod actuatable with each of said key bars for sensing the presence of coded information in said control means and for preventing operation of selected type bars in the absence of coded information in said control means.

11. A control card for use with an instructional aid device having selected perforations providing coded information adapted to permit a probe to pass therethrough, at least two vertically spaced and aligned apertures adapted to permit a portion of an aligning member and a beak of a pawl member to pass therethrough, and means along the side edges thereof adapted for receiving biased retention means for yieldably holding said card at least partially within the device.

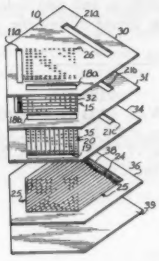
4,185,401

ARITHMETIC GAME BOARD

Helen A. Smathers, Rte. 3, Dawsonville, Ga. 30534

Filed Nov. 21, 1977, Ser. No. 853,260
Int. Cl.[2] G09B *19/02*
U.S. Cl. 35—31 C **3 Claims**

1. A game board for solving problems wherein the parts of the problems have an arithmetic relationship to one another, said game board including a first indicator means for representing a first portion of a problem, said first indicator means being manipulable to provide a first indication, a second indicator means for representing a second portion of said problem, said second indicator means being manipulable to provide a second indication, said second indication being within said first indication, and a third indicator means for representing a third portion of said problem, said third indicator means providing a third indication, said third indication comprising a change in said second indication, said game board comprising a plurality of layers, a first layer of said plurality of layers defining a plurality of apertures therethrough, said plurality of apertures being arranged in a plurality of columns and a plurality of rows, said columns and said rows intersecting one another and being angularly disposed with respect to one another, a second layer of said plurality of layers, said first indicator means being within said second layer, said first layer defining a slot therethrough for manipulation of said first indicator means, a third layer of said plurality of layers, said second indicator means being within said third layer, said first indicator means including a first plurality of slides, each slide of said first plurality of slides being aligned with one column of said plurality of apertures, said first plurality of slides defining a second plurality of apertures therethrough, said first plurality of slides being so constructed and arranged that one slide in said plurality of slides is visible through one column of apertures of said first



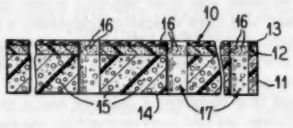
plurality of apertures when said one slide is in a first position, and said second plurality of apertures are aligned with said one column of apertures when said one slide is in a second position, a fourth layer of said plurality of layers, said third indicator means being within said fourth layer, said second indicator means including a second plurality of slides, each slide of said second plurality of slides being aligned with one row of said first plurality of apertures, said second plurality of slides defining a third plurality of apertures therethrough, said second plurality of slides being so constructed and arranged that one slide of said second plurality of slides is visible through one of said first plurality of apertures when said one slide of said second plurality of slides is in a first position and one of said second plurality of apertures is aligned with said one of said first plurality of apertures and said third plurality of apertures is aligned with one of said rows of said first plurality of apertures when said second plurality of slides is in a second position, said third indicator means including a third plurality of slides defining a fourth plurality of apertures, one slide of said third plurality of slides being disposed along the bisector of the angle between said columns and said rows of said first plurality of apertures and intersecting an intersection of each of said columns and said rows, each of said third plurality of slides being parallel to said one slide of said third plurality of slides and intersecting at least one intersection of said columns and said rows of said first plurality of apertures.

4,185,402

DEODORIZING INSOLE

James S. Digate, Chicago, Ill., assignor to Scholl, Inc., Chicago, Ill.

Filed Nov. 2, 1977, Ser. No. 847,918
Int. Cl.[2] A43B *13/38*
U.S. Cl. 36—44 **10 Claims**



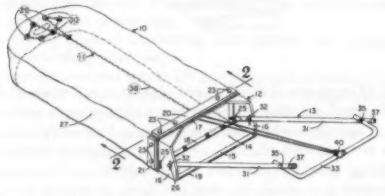
1. An insole for footwear which comprises a multi-sheet laminate shaped to overlie the inner sole of footwear and composed of a bottom open cell resilient compressible plastics sheet with a smooth bottom skin for resting on the inner sole of the footwear, an intermediate pliable relatively incompressible plastics sheet having particles of an odor-absorbing chemical dispersed uniformly therethrough and locked therein, a top fabric sheet presenting a slippery abrasion resisting top surface for the foot of the wearer, said sheets being bonded together in unitary relation, and holes extending through all of the layers thereof exposing the chemical particles in the intermediate layer, said open cell resilient bottom layer being compressible under the foot load applied thereto to pump air from the cells through the holes in intimate contact with the chemical to absorb odors and moisture, and said holes being sufficiently large so as not to be closed during the compression of the bottom layer.

4,185,403

SNOW REMOVAL AND TRANSPORT DEVICE

William H. Hardgrove, R.R. 2, Box 435, Libby, Mont. 59923

Filed Jul. 17, 1978, Ser. No. 925,386
Int. Cl.[2] E01H *5/02*
U.S. Cl. 37—53 **4 Claims**



1. A manually operated tool for removal and transport of snow for disposition, comprising, in combination:

a peripherally defined rigid scoop frame having a top interconnecting similar, substantially vertical sides and an elongate bottom element with a substantially planar downturned forward margin;

a handle extending forwardly and upwardly from pivotal joinder with the scoop frame, the handle comprising similar elongate side elements pivotably communicating in their rearward parts with the sides of the scoop frame for limited pivotable motion relative to the scoop frame to change the angular orientation of the bottom element of the scoop frame relative to an underlying supportative surface between a scooping mode and a transporting mode responsive to a handle motion, each side element being pivotably interconnected in its forward part by a "U" shaped handle bar extending therebetween and limited in its pivotable motion relative to the side elements from a rearward to a forward position;

an elongate flexible bag releasably communicating about the scoop frame and extending rearwardly therefrom with a closable opening in the rearward part of the bag; and

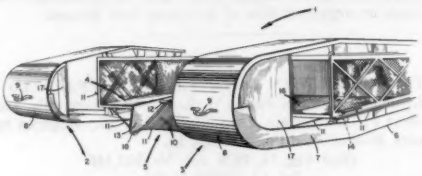
closure means associated with the flexible bag to allow pre-determined opening and closing of the rearward opening therein defined responsive to pivotable motion of the "U" shaped handle bar.

4,185,404

NODULE DREDGING BUCKET

Jean-Pierre Hue; Christian Charles, and François Le Foll, all of Brest, France, assignors to Centre National Pour l'Exploitation des Oceans (CNEXO), Paris, France

Filed Sep. 21, 1977, Ser. No. 835,314
Claims priority, application France, Sep. 21, 1976, 76 28291
Int. Cl.[2] E02F *5/00*
U.S. Cl. 37—71 **16 Claims**



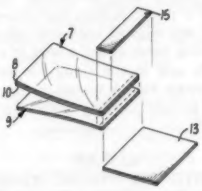
1. A bucket for dredging the sea bottom in order to collect nodules, comprising a box-like parallel-sided basket open at the front, the basket having a bottom wall with front and rear cross-bars and a plurality of parallel spaced rods extending longitudinally of the basket between said front and rear cross-bars, said bottom wall embodying at its front part a grill with a transverse front link and a plurality of longitudinal spaced flexible elements which are inclined downwardly towards the front and stretched between said front cross-bar and the transverse front link; and large shoes vertically spaced from said front and rear cross-bars of said bottom wall and positioned underneath each lateral side of said basket and having soles with generally horizontal planar surfaces for supporting the bucket on the sea bottom, said grill being situated between said shoes with said transverse front link being positioned in such manner that it extends below said soles and penetrates the sea bottom, said basket extending to external edges of said shoes; and means for hooking said bucket to a dredging line fitted on said shoes.

4,185,405

PREFABRICATED LAMINATING PACKET WITH TAB

Joe D. Giulie, Palo Alto, Calif., assignor to General Binding Corporation, Northbrook, Ill.

Filed Apr. 5, 1977, Ser. No. 784,668
Int. Cl.[2] G09F *3/00*
U.S. Cl. 40—2.2 **17 Claims**



1. A laminating packet for insertion into a laminating machine having a heating means, comprising in combination:

a. a first sheet and a second sheet of a heat laminating material, said first and second sheets being of substantially the same size and lying over each other;

b. means for holding said sheets together along one marginal edge thereof; and

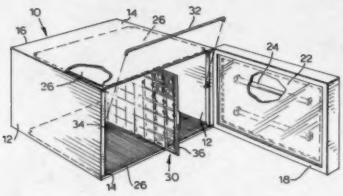
c. means for pulling the first and second sheets through the laminating machine comprising a detachable tab extending from said one marginal edge;

4,185,406

MULTISLIDE HOLDER AND EDITOR AND CABINET THEREFOR

Simon C. Schotsman, 7 McIntosh Ave., Hamilton, Ontario, Canada (L9B 1J3)

Filed Mar. 13, 1978, Ser. No. 886,273
Int. Cl.[2] G02B *27/02*
U.S. Cl. 40—361 **7 Claims**



1. A cabinet for a multislide holder and editor comprising a body of rectangular cross section having two first opposite side walls and two second opposite side walls and a first end wall,

a rectangular door member of approximately the size of the said first end wall hingedly mounted to the body for movement between a closed position in which it closes the other end of the body and an open position in which it is coplanar with a first side wall,

light-producing means mounted on the door member to provide illumination at the door member inner side,

channel forming members on the interior surfaces of the two second opposite cabinet side walls providing a plurality of spaced pairs of channels, each channel pair receiving therein a respective plate-like multislide holder body for movement between a stored position in which it is inside the cabinet, and a viewing position in which it is parallel to and register with the door in open position for slides in the holder to be viewed by the illumination of the said light producing means,

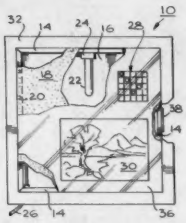
wherein the said plate-like multislide holder body comprises a rectangular plate-like body providing a plurality of pockets each receiving a respective slide therein, the pockets being formed between a first plurality of spaced parallel wall-forming rib members extending parallel to two of the body edges, and a second plurality of spaced parallel wall-forming rib members extending parallel to the other two body edges and at right angles to the said first plurality, each pocket having on each of two opposite side walls thereof two spaced substantially parallel slide edge-engaging member providing between themselves an open-ended channel for receiving therein a slide edge to support the slide in the holder pocket, a first one of said edge-engaging members comprising at least two longitudinally-spaced portions having at least one gap between them, and the second of said edge-engaging members comprising at least one portion each disposed opposite to and in register with a respective gap in the first edge-engaging member and of length not greater than that of the said respective registering gap.

4,185,407

DISPLAY DEVICE

Jack W. Lamb, 13561 Sherman Way No. 208, Van Nuys, Calif. 91405

Filed Oct. 1, 1976, Ser. No. 728,634
Int. Cl.[2] G02B *27/02*
U.S. Cl. 40—367 **11 Claims**



1. An improved display device, said device comprising, in combination:

a. a hollow container having interconnected sidewalls and bottom wall and an open top;

b. a light secured in said container and lying in a first plane;

c. a light-diffusing display sheet disposed on said top and lying in a second plane;

d. means associated with said container for varying the distance between said first and second planes; and,

e. a frame connected to said container so as to overlie said display sheet and to be movable therefrom; and,

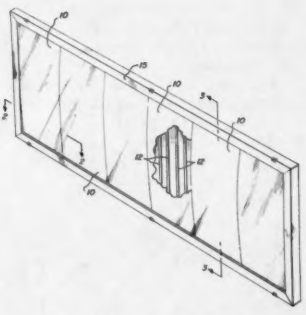
f. whereby the light intensity on any given location on said display sheet can readily be varied.

4,185,408

BACK-LIGHTED SIGNBOARD

Charles H. Tracy, 16515 Kingswood Dr., Lakeville, Minn. 55044

Filed Sep. 19, 1977, Ser. No. 834,490
Int. Cl.[2] G09F *13/04*
U.S. Cl. 40—564 **7 Claims**



1. A back-lighted billboard for day and night display of large posters adapted for installation on the billboard, comprising:

(a) a billboard frame assembly for providing a structural support member for said billboard;

(b) a plurality of spaced light sources mounted on said billboard frame assembly;

(c) a transparent poster support surface mounted on said billboard frame assembly in front of said spaced light sources and having a convex outer curvature;

(d) means for attaching a poster edge proximate a first horizontal edge of said transparent poster support surface, said means including detachable means for attaching to said

poster edge extending along and proximate to said first horizontal edge;

(e) tensioning means for tensioning said poster over said transparent poster surface, said tensioning means being attached to said billboard frame assembly proximate a second horizontal edge of said transparent poster support surface, and including a plurality of adjustable spring tensioning devices attachable to said posters.

4,185,409

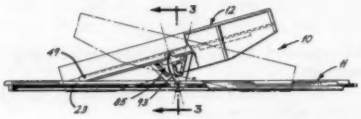
TEETER-TOTTER TRACK SECTION FOR MODEL VEHICLES

Richard C. M. Cheng, Suite 1604, Austin Center, Kowloon B.C.C., Hong Kong

Filed Apr. 17, 1978, Ser. No. 896,773

Int. Cl.[2] A63H *18/12, 18/16*

U.S. Cl. 46—1 K **9 Claims**



1. A see-saw track section interposable in a model vehicle track system having electrical conductors, said see-saw track section comprising a base track part having electrical conductors and mechanically and electrically interposable in the track system, a super track part having electrical conductors and located longitudinally over said base track part, means mounting said super track part for swinging movement about a transverse axis to alternatively place either end of super track part downwardly on said base track part and the opposite end upwardly spaced over said base track part, and electrical connection means between the conductors of said base and said super track part, for controlling movement of an electrically powered vehicle from said base track part onto the downward end of said super track part and upwardly therealong past said axis for gravitational swinging of said opposite end downwardly.

4,185,410

SLIDEABLE SUSPENSION DEVICE

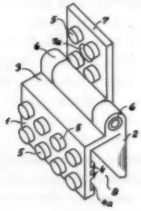
Knud M. Kristiansen, Billund, Denmark, assignor to Interlego A.G., Baar, Switzerland

Filed Jun. 20, 1977, Ser. No. 808,038

Claims priority, application Denmark, Jun. 29, 1976, 2924/76

Int. Cl.[2] 463H *33/06*

U.S. Cl. 46—23 **4 Claims**



1. A suspension device for slideable and pivotal suspension of a base plate, one face of which is provided with a plurality of studs uniformly spaced apart in both longitudinal and transverse directions, so as to form a plurality of adjacent rows, said device comprising a substantially box-shaped gripping member having a front wall, a rear wall and an intermediate top wall defining a cavity open at the bottom and at both ends with said front and rear walls being in fixed relationship; guide means comprising at least one longitudinally extending flange projecting inwardly into said cavity from the inner face of the front wall intermediate the top wall and the open bottom of the gripping member, so as to provide a lengthwise extending channel adapted to receive one row of studs adjacent one edge of a base place slideably mounted in said cavity; bearing means formed integrally with the top wall and defining an axis of rotation for said cavity extending in the lengthwise direction of the gripping member adjacent the top edge thereof; a hinge member pivotally mounted to said bearing means for swinging movement of the gripping member relatively to the hinge member around said axis of rotation.

4,185,411

STRUCTURAL ELEMENT AND A COVER MEMBER OF A TOY CONSTRUCTION KIT

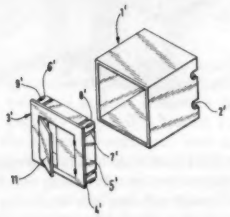
Artur Fischer, Weinhalde 34, D-7244 Waldachtal 3, (Tumlingen), Fed. Rep. of Germany

Filed Feb. 6, 1978, Ser. No. 875,295

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1977, 7705362[U]; Aug. 23, 1977, 2737844

Int. Cl.[2] A63H *33/08*

U.S. Cl. 46—23 **13 Claims**



1. A structural element of a toy construction kit, comprising a hollow structural member having an inner passage; means for connecting said structural member with another structural member; and a cover member detachably engageable in said inner passage of said structural member and provided with means forming an aperture, such as a window or a door, said cover member having a portion insertable in and engageable with said inner passage of said hollow structural member and having two ends spaced from one another, said portion of said cover member having at least two slots extending from one of said ends toward the other end and forming therebetween a section which is separated by said slots from a remainder section of said portion, said section having an outer surface provided with a projection.

4,185,412

TOY FIGURE WITH ACCESSORIES

Dietmar Rahmstorf, Nuremberg, Fed. Rep. of Germany, assignor to BIG Spielwarenfabrik Dipl.-Ing. Ernst A. Bettag, Fürth, Fed. Rep. of Germany

Filed Jan. 3, 1978, Ser. No. 866,222

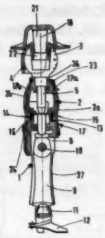
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1977, 2701754

Int. Cl.[2] A63H *13/00*

U.S. Cl. 46—116 **6 Claims**

1. In a toy figure made from plastics including a head, a trunk, a pair of arms having pivot connections to said trunk, a pair of legs and a representation of a garment piece fittable to at least the trunk, wherein the garment piece completely surrounds the trunk of the toy figure and is divided into a front portion and a rear portion along a vertical plane passing through said pivot connections of the arms and which have side edges alignable with each other, the front and the rear portions of the garment piece being respectively separately

securable on the trunk by means of a single detachable detent connection at the frontside and a single detent connection at



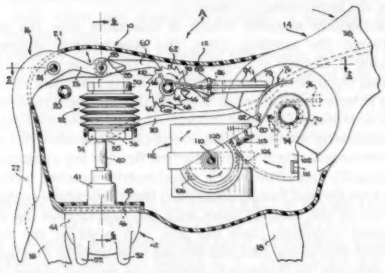
the rearside of the toy figure, the detent connections each comprising a detent member and a detent counter member.

4,185,413

TOY MILKABLE ANIMAL FIGURE

Adolph E. Goldfarb, 4614 Monarce Dr., Tarzana, Calif. 91356; Erwin Benkoe, deceased, late of Encino, Calif.; by Elisabeth Benkoe, executrix, 17965 Medley Dr., Encino, Calif. 91316; Elonne Dantzer, Redondo Beach, Calif.; William R. La Dow, Cincinnati, Ohio; Wayne M. Ginn, Independence, Ky., and L. Ray Dyson, Milford, Ohio, assignors to Adolph E. Goldfarb, Northridge, Calif. and Elisabeth Benkoe, Northridge, Calif., Executrix for the Estate of Erwin Benkoe

Filed Feb. 9, 1978, Ser. No. 876,419
Int. Cl.[2] A63H *13/02*
U.S. Cl. 46—118 **23 Claims**



1. A liquid drinking and discharging toy animal apparatus comprising:

(a) a body having a torso with front and rear ends;

(b) a head mounted on the front end for movement from an upper to a lower position, said head having an opening for the intake of a liquid;

(c) a chamber on said body for receiving the liquid and representing an udder of said animal apparatus;

(d) an appendage on said torso capable of being shifted to cause an intake of liquid for introduction into said udder;

(e) means operatively associated with said head and said appendage for maintaining said head in said lower position for a predetermined number of shifting movements of said appendage;

(f) means operatively associated with said head for causing said head to move to said upper position after said predetermined number of shifting movements of said appendage; and

(g) teat means on said udder connected to and defining an outlet from said chamber, said teat means being flexible and manually squeezable to cause the release of liquid through said outlet.

17. A liquid drinking and discharging toy animal apparatus comprising:

(a) a body having a torso with front and rear ends;

(b) a head mounted on the front end for movement from an upper to a lower position, said head having an opening for the intake of a liquid;

(c) a chamber on said body for receiving a liquid and representing an udder of said animal apparatus;

(d) tube means cooperatively connecting said opening on said head and said chamber so that liquid introduced through said head opening may be delivered to said chamber;

(e) an extension on said udder representing a teat and communicating with said chamber for having liquid in said chamber introduced into said teat, said teat being formed of a flexible resilient material capable of being manually manipulated, said teat having a discharge means at a lower end thereof for discharging liquid therein upon manual manipulation thereof;

(f) an appendage on said torso capable of being shifted for pumping liquid through into said udder on reciprocative movement of said appendage;

(g) means operatively associated with said head and said appendage for maintaining said head in said lower position for a predetermined number of shifting movements of said appendage;

(h) means operatively associated with said head for biasing said head to said upper position after said predetermined number of shifting movements of said appendage; and

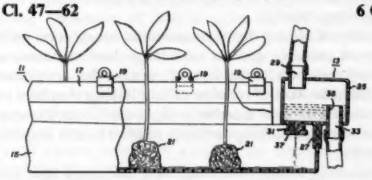
(i) valve means at the other end of said teat adjacent to the position at which said teat is connected to said udder for controlling liquid flow into said teat so that during manual manipulation of said teat, said valve will restrict further liquid flow between said teat and said udder and the liquid in said teat will be discharged during such manual manipulation, said valve means closing and said discharge means opening upon manual manipulation of said teat and said valve means opening and said discharge means closing immediately after manual manipulation of said teat.

4,185,414

FEED REGULATOR FOR NUTRIENT FILM AGRICULTURE SYSTEM

William M. Miller, Lafayette, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Nov. 7, 1977, Ser. No. 848,818
Int. Cl.[2] A01G *9/24, 25/16*
U.S. Cl. 47—62 **6 Claims**



1. A nutrient film agriculture system comprising:

(a) a plurality of elongated and horizontally sloped plant growth containers each accommodating a plurality of plants spaced along its length with the plant roots supplied with liquid nutrient by flow thereof along the bottom of the container in contact with the plant roots;

(b) a plurality of nutrient feed regulators each mounted adjacent the higher end of one of said plant growth containers and each comprising:

(i) housing means defining a nutrient reservoir and further defining a nutrient inlet and nutrient feed and bypass outlets;

(ii) means in said feed outlet defining a metering orifice for controlled flow of nutrient from said reservoir into the adjacent plant growth container in accordance with the

metering orifice area and the hydrostatic pressure across said orifice; and

(iii) reservoir level control means comprising a weir disposed between said feed outlet and said bypass outlet for bypassing such quantity of nutrient as necessary to control the reservoir level above said feed outlet;

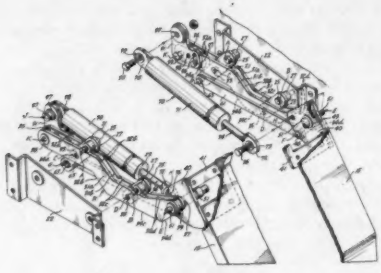
(c) and means for supplying nutrient liquid to the inlets of all of said feed regulators in quantities such as to produce bypass flow in each of said regulators to thus maintin constant the reservoir level therein and the hydrostatic head established thereby across said metering orifice thereby to maintain a predetermined nutrient flow rate to each of the plant growth containers of the system.

4,185,415

ARTICULATED HINGE COOPERATING WITH AN ENERGY STORAGE DEVICE CAPABLE OF AUTOMATICALLY OPENING AND HOLDING OPEN AN UNLATCHED COMPARTMENT DOOR

Richard J. LaConte, Auburn, Wash., assignor to The Bo ing Company, Seattle, Wash.

Filed Apr. 14, 1978, Ser. No. 896,398
Int. Cl.[2] E05D *15/40*; E05F *1/10*
U.S. Cl. 49—248 **8 Claims**



1. An articulated hinge apparatus having a movable pivot axis cooperating with an energy storage device capable of automatically opening and holding open an unlatched compartment door comprising:

a support member;

a hinge base member;

a plurality of linking members mounted for rotation on said support member and on said hinge base member, said linking members having axes of rotation that are mutually parallel, the axes of rotation of said linking members relative to said support member being spaced from the axes of rotation of said linking members relative to said hinge base member;

first mounting means associated with said hinge base member and said compartment door for rotatively mounting said compartment door on said hinge base member about an axis of rotation parallel with the axes of rotation of said plurality of linking members;

coupling means associated with said plurality of linking members and said compartment door for rotating at least one of said plurality of linking members relative to said support member, whereby the axis of rotation of said first mounting means moves along a predetermined path as said compartment door is rotated about said axis of rotation of said first mounting means; and

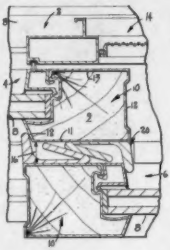
an energy storage device associated with said hinge base member and said compartment door, said energy storage device being operable to exert a force on said compartment door for urging said compartment door to rotate from a closed position to a first open position, and for maintaining said compartment door in said first position.

4,185,416

WEATHERSTRIP

Richard J. Wilmes, Stillwater, Minn., assignor to Andersen Corporation, Bayport, Minn.

Filed Jul. 20, 1978, Ser. No. 926,274
Int. Cl.[2] E06B *7/24*
U.S. Cl. 49—406 **10 Claims**



1. An improved sliding door unit having a frame; first and second door panels, at least one of the door panels being slidable in the frame relative to the other door panel to open and close a door opening; wherein each door panel includes a vertically extending meeting stile, wherein each meeting stile includes a longitudinal surface and two side edges which extend rearwardly from the longitudinal surface to define opposed sides of the meeting stile, the meeting stiles being located adjacent and opposed to one another with the longitudinal surfaces thereof being disposed in a face-to-face relationship and spaced from one another by a gap when the first and second door panels are disposed in a closed orientation; and wherein the improvement relates to:

a weatherstrip material which is insertable into the gap between the meeting stiles, the weatherstrip material having a flexible configuration to allow the gap to be sealed regardless of any variation in the thickness of the gap from a nominal value, wherein the weatherstrip material comprises first and second longitudinally elongated weatherstrip members, each weatherstrip member having a substantially rigid base and a first flexible leg projecting outwardly therefrom, each weatherstrip member having the base thereof fixedly secured to the longitudinal surface of one of the meeting stiles with the first flexible leg extending outwardly into the gap, and wherein the first flexible legs of the first and second weatherstrip members are oriented on the bases to engage one another to seal the gap between the meeting stiles, wherein the rigid base further includes a second outwardly projecting flexible leg thereon, said second leg extending substantially outwardly from the base in the same direction as the first leg and into the gap, wherein the second flexible leg is pivotably movable relative to the base to vary the angle that the second leg forms relative to the base, and wherein the second flexible leg extends outwardly sufficiently far from the rigid base and is located thereon such that the second leg of each weatherstrip member engages one of the side edges of the meeting stile on which the other weatherstrip member is secured, whereby the second legs of the weatherstrip members mask off the gap to minimize weather infiltration through the gap.

4,185,417

WEATHER SEAL APPARATUS

Henry S. McKann, Fredericksburg, Va., assignor to General Products Company, Inc., Fredericksburg, Va.

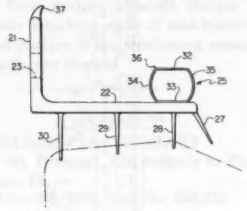
Filed Sep. 5, 1978, Ser. No. 939,193
Int. Cl.[2] E06B *1/70*
U.S. Cl. 49—470 **4 Claims**

1. A weather seal for use in combination with a swingable closure in an access opening of the type having a generally

rectangular form with means along one vertical side for swingably supporting the closure, the closure having inner and outer major faces and a bottom edge, the opening having a sill member extending across the bottom thereof below the bottom of the closure in its closed position, the weather seal comprising

an elongated mounting member having first and second substantially planar legs fixedly attached to each other to form a body having a generally L-shaped cross section;

means defining openings through said first leg of said L-shaped member to receive fasteners for attaching said first leg to a vertical major surface of the closure with said second leg of said member extending generally horizontally beneath the bottom edge of the closure;



a tapered projection on an upper edge of said first leg for forming a seal against a vertical major surface of the closure;

an elongated, resilient, hollow tubular seal member fixedly attached to the inner, upper surface of said second leg, said tubular seal member being between said second leg and the bottom edge of the closure and in contact therewith when said mounting member is attached to said closure; and

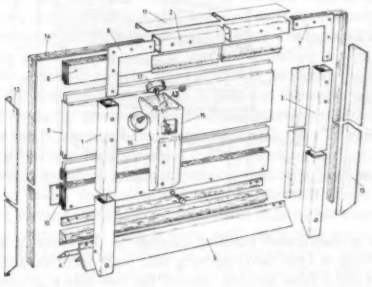
a plurality of elongated resilient ribs fixedly attached to and protruding from the outer, lower surface of said second leg, said ribs extending along substantially the entire length of said leg, at least two of said ribs extending substantially perpendicular to said outer surface thereof.

4,185,418

SLIDING DOOR, MEANT ESPECIALLY TO BE USED IN FIRE PROTECTION OR INSULATION

Jan J. Markus, Krimpen aan den Ijssel, Netherlands, assignor to Markus Hermetische Deuren B. V., Krimpen aan den Ijssel, Netherlands

Filed Dec. 28, 1977, Ser. No. 865,286
Int. Cl.[2] E06B *3/00*
U.S. Cl. 49—501 **2 Claims**



1. A sliding door constructed for use in fire protection or insulation comprising

a framework including

a pair of side vertical profiles connected to a top horizontal profile,

an underguiding profile connected near the bottom of said side vertical profiles,

corner pieces in the shape of flat right angles connecting said top horizontal profile at each of its ends to each of said side vertical profiles,

framework panels interconnected to each other and attached to said profiles,

corner profiles clamping said panels against said profiles,

a web rubber sealing profile extending over the edges of said panels and clamped between said corner profile and said panels, and

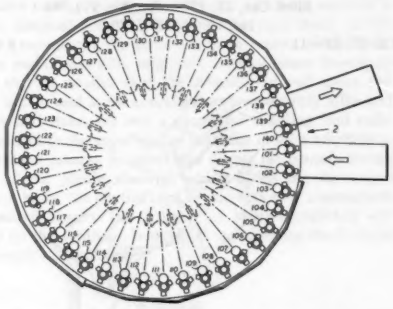
at least one wheel bracket with guiding wheels attached at a top corner of said framework.

4,185,419

WORKING METHOD FOR THE AUTOMATIC BURSTING-OFF AND GRINDING THE EDGES OF GLASSES, AND AUTOMATIC MACHINE FOR CARRYING OUT SUCH METHOD

Emil Ilk, Ahornweg 4, 8372 Zwiesel, Fed. Rep. of Germany

Filed Oct. 25, 1977, Ser. No. 845,296
Claims priority, application Fed. Rep. of Germany, Jan. 7, 1977, 2700487
Int. Cl.[2] B24B *9/12*
U.S. Cl. 51—5 R **14 Claims**



9. An apparatus for automatically cracking-off edge portions from the remainder of hollow glass articles and for finish grinding an edge on the remainder of the glass articles, said apparatus comprising means for conveyor means for moving the articles automatically through each of a plurality of stations, means for scribing the articles with an annular cut to form a weakened area in the glass at a scribing station, means for heating and cracking off the scribed edge portion at a crack-off station, means for grinding the internal and external sides of the glass edge at a grind trimming station, means for fine grinding of the edge at a fine grinding station to finish the same, and means for polishing the ground edge at a polishing station to form a smooth finished edge on said glass articles.

4,185,420

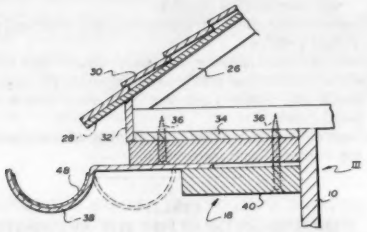
EAVESTROUGHING SYSTEM

Morson A. Medland, 175 Manor Ave., Ottawa, Ontario, Canada (K1M 0H1)

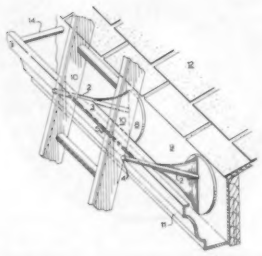
Filed May 19, 1978, Ser. No. 907,811
Int. Cl.[2] E04B *13/00*
U.S. Cl. 52—11 **9 Claims**

1. A support member for attachment to a roof to support an eavestrough comprising a guide portion having an upper surface adapted for connection to an eave of said roof, a bracket having one end thereof shaped to receive a gutter section and another end formed as an elongate portion, interconnecting means interconnecting said bracket and said guide portion, said

interconnecting means including a channel in said guide portion extending generally parallel to said upper surface and slidably receiving said elongate portion of said bracket to permit sliding movement of said elongate portion in said channel between a first position and a second position, so that in said first position said one end is supported outside the periphery of a roof and in said second position said one end is supported below said eave within the periphery of said roof.



4,185,421
GUTTER PROTECTOR ASSEMBLY
Jackie Robinson, 118 Hillside St., Shelby, N.C. 28150
Filed Dec. 21, 1978, Ser. No. 971,795
Int. Cl.[2] E04D *13/04*
U.S. Cl. 52—11 **6 Claims**



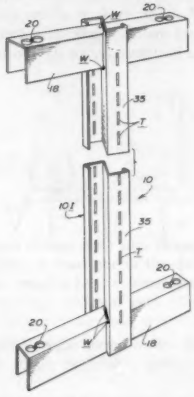
1. An "H" shaped gutter protection device composed of two parallel stanchions connected one to another by a crossmember, each of said stanchions having a longitudinal passageway therethrough adapted to receive a nail and each of said stanchions having a foot means attached thereto, said foot means having a flat portion disposed at an angle other than 90° to the longitudinal axis of said stanchion and a passageway therethrough in communication with the passageway in said stanchion.

4,185,422
FREE STANDING WALL
John R. Radek, Hinsdale, Ill., assignor to Ready Metal Manufacturing Company, Chicago, Ill.
Filed Oct. 3, 1977, Ser. No. 838,962
Int. Cl.[2] E04B *2/82*
U.S. Cl. 52—36 **11 Claims**

1. A modular structural assembly comprising a vertical post having an attachment member adjacent to the upper and lower ends thereof for connecting a horizontal stringer to each member,

(a) said post comprising a bar of Z-shaped cross-section having a pair of spaced parallel walls with a diagonal web extending between the laterally displaced opposite edges of said walls, and transverse flanges extending inwardly from the opposite free edges of said parallel walls,

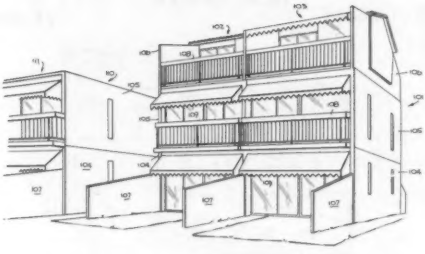
(b) each of said attachment members comprising a short horizontal channel section, having spaced vertical flanges and a horizontal intermediate web, penetrating said diagonal web and integrally connected therewith at the intersecting joint adjacent to each end of said post and having limited lengths thereof projecting from the opposite sides of said diagonal web beyond said transverse flanges,



(c) at least one of said lengths having a keying aperture in the diagonal web adjacent the free end thereof, and

(d) a horizontal channel member adapted to be disposed in nesting relation with respect to each of said short channel sections, and having coupling means adjacent the ends thereof for detachable engagement with the keying apertures in adjacent attachment members on the same level to form upper and lower stringers between adjacent vertical posts.

4,185,423
LIGHTWEIGHT BUILDING MODULE
Enrique H. Gutierrez, San Juan, P.R., assignor to Systems Concept, Inc., Miami, Fla.
Filed Mar. 27, 1978, Ser. No. 890,247
Int. Cl.[2] E04B *1/34*
U.S. Cl. 52—79.9 **18 Claims**



1. A prefabricated building module in the form of a box comprising at least two opposing side wall portions, a ceiling portion and a floor portion, each of the two side wall portions and the ceiling portion including a thin layer of concrete-like material and a plurality of elongated metallic reinforcing members extending approximately vertically across one surface of the thin layer of each side wall portion in the manner of studs and extending across the one surface of the ceiling portion in

the manner of joists, with one edge portion of each reinforcing member being embedded in the one surface and the other edge portion of each reinforcing member extending outwardly therefrom, and a means rigidly attaching the reinforcing members of each of the side wall portions to corresponding reinforcing members of the ceiling portion and to the floor portion for forming a rigid, box-like structure, wherein the improvement comprises:

a plurality of elongated metallic reinforcing members extending in spaced relation transversely of the floor portion in line with the respective lower ends of the side wall reinforcing members and

the means for attaching the lower end portions of the reinforcing members of each of the side wall panels to the edges of the floor portion adjacent thereto comprise means for rigidly attaching each of said lower end portions to the end portion of the reinforcing member of the floor portion adjacent thereto.

4,185,424

MOLDED PLASTIC STAKE

Kenneth F. Streit, Mt. Prospect, Ill., assignor to Phone-Ducs, Inc., West Chicago, Ill.

Filed Mar. 13, 1978, Ser. No. 885,533
Int. Cl.[2] G01C *15/02, 15/04*
U.S. Cl. 52—103 R **8 Claims**

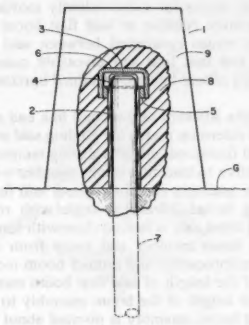
1. A molded plastic stake comprising: a body having a leading end adapted to penetrate the ground and a trailing end adapted to be disposed above the ground and to be readily visible, said body being comprised of a plurality of interconnected webs extending from said leding end to said trailing end, a bridging section between said webs at the trailing end of said body, said webs and said bridging sections each having a rounded upper surface and said rounded surfaces cooperating to collectively define a striking surface for driving said stake into the ground, said striking surface including a centrally disposed generally circular domed portion including the inner end of the rounded surface of each web and the upper surface of said bridging sections, said bridging sections tapering inwardly and downwardly from said striking surface to adjacent webs to provide reinforcement for said striking surface, said webs each having a length dimension that is at least several times its width dimension and tapering inwardly from said striking surface to an intermediate point located between said striking surface and said leading end, each web having an outwardly extending portion at said intermediate point disposed generally perpendicularly to the length of the stake, said outwardly extending portions cooperating to collectively define a shoulder to resist pulling of said stake out of the ground, and said webs tapering inwardly from the outer ends of said outwardly extending portions and merging at a point at said leading end of the stake.

4,185,425

SURVEYOR'S MONUMENT

Jon A. Merkel, Old U.S. 1 North, Southern Pines, N.C. 28307

Filed Sep. 5, 1978, Ser. No. 939,255
Int. Cl.[2] E04H *13/00*
U.S. Cl. 52—103 **6 Claims**



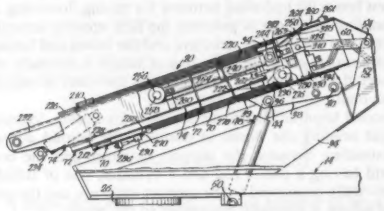
1. A surveyor's monument compromising a body made of rigid synthetic material, having a central core therein adapted for placement on the top of a conventional surveyor's metal stake, said stake having a slightly tapered upper end, said central core compromising (a) a section of tubing made of a synthetic material complementary to the rigid body of the surveyor's monument, (b) a stake locking means, placed over the upper end of said tube, said stake locking means having an opening therein smaller than the diameter of said stake and through which said stake is pressed to permanently affix said means to said stake, (c) and a means for securing said stake locking means to the upper end of said tube in such a fashion as to prevent the passage into said tube during the manufacturing process of the plastic material which forms the surveyor's monument body, the central core of said surveyor's monument compromised of parts (a), (b), and (c), being completely surrounded by the synthetic material compromising the body of the surveyor's monument.

4,185,426

EXTENSION/ELEVATION INTRA-ACTION DEVICE FOR AERIAL LIFT APPARATUS

William A. Prescott, Savannah, Mo., assignor to A-T-O Inc., Willoughby, Ohio

Filed Jan. 30, 1978, Ser. No. 873,516
Int. Cl.[2] E04H *12/34*
U.S. Cl. 52—115 **8 Claims**



1. In an aerial lift apparatus adapted to be supported upon a generally horizontal plane with respect to the earth's surface and having a mobile base and a boom assembly carried thereon and vertically pivotable with respect to said base, said boom assembly including a vertically pivotable first elongate boom member mounted about a first substantially fixed horizontal pivot axis on said mobile base and adapted for pivoting through an increasing included vertical angle with respect to

said base and a second elongate boom member carried by, and guided for reciprocable movement relative to, said first boom member, and means for pivoting said boom assembly about said first axis, the improvement comprising:

a fixed-length link having first and second ends, said link pivotably connected at said first end about a second substantially fixed horizontal pivot axis to said base;

an extension means for independently moving said second boom member relative to said first boom member, said extension means connected between said second boom member and said link and pivotably connected at said second end of said link about a third horizontal pivot axis; and

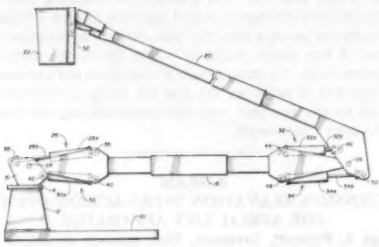
a guide means adjacent said second link end and connected with said extension means for guiding said second link end along said first boom member during reciprocating movement relative to said first boom member whereby, when said boom assembly is pivoted about said first axis into an increasing included vertical angle with respect to said base, said third axis is moved therewith longitudinally of said first boom member and away from said first axis thereby reciprocating said second boom member along a portion of the length of said first boom member to cause the overall length of the boom assembly to increase, and when said boom assembly is pivoted about said first axis into a decreasing included vertical angle, the overall length of the boom assembly decreases.

4,185,427

DOUBLE CYLINDER OVER-CENTER AERIAL DEVICE

James W. Raymond, Duluth, Minn., assignor to Reach-All Manufacturing & Engineering Co., Duluth, Minn.

Filed Jun. 1, 1978, Ser. No. 911,340
Int. Cl.[2] E04H *12/34*
U.S. Cl. 52—115 **6 Claims**



1. An aerial device comprising:

a boom support structure;

a boom pivotally secured to the support structure by pivotal means defining a substantially horizontal boom pivot axis;

a first boom lift hydraulic actuator for raising, lowering, and holding the boom in position, the first actuator extending between the support structure and the boom and having a piston rod and a cylinder, one of which is pivotally connected to the support structure and the other of which is pivotally connected to the boom;

a second boom lift hydraulic actuator for raising, lowering, and holding the boom in position, the second actuator extending between the support structure and the boom and having a piston rod and a cylinder, one of which is pivotally connected to the support structure and the other of which is pivotally connected to the boom;

the pivotal connections of the first and second actuators, respectively, to the support structure and to the boom being so disposed with respect to the boom pivot axis that regardless of boom position, one of the first and second actuators is under tension and the other is under compression due to the load of the boom;

a source of hydraulic fluid under pressure; and

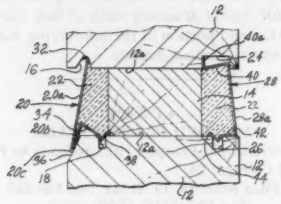
control means for controlling hydraulic fluid pressure to the first and second actuators to cause the first and second actuators to operate in tandem in raising, lowering, and holding the boom in position.

4,185,428

JOINT FOR SEALING LOGS OF LOG TYPE BUILDING STRUCTURES

Jacques Boucquey, 13 St. Laurent St., West, Longueuil, Canada; Bernard Laporte, 3312 Clément St., Fabreville, Canada, and Serge Lavallee, 9 du Grand Ravin Ave., St. Julie, Canada (J0L 2C0)

Filed Apr. 13, 1978, Ser. No. 895,926
Int. Cl.[2] E04B *1/10*
U.S. Cl. 52—233 **3 Claims**



1. A joint for sealing a pair of juxtaposed substantially parallel and horizontally disposed, upper and lower logs separated by spacer blocks located at spaced intervals along said logs and which are recessed from the exposed face of said logs, said logs having confronting faces engaged by said spacer blocks and provided with longitudinally extending grooves arranged substantially parallel to said exposed face and between said exposed face and said spacer blocks, said joint comprising a flat strip of resilient material having a profile including, from one longitudinal edge to the other longitudinal edge, a first terminal, longitudinal edge portion forming the top free edge of said strip and engaging the groove of the upper log, a main portion bridging the space between said logs and overlapping the exposed space of the lower log, said main portion being extended at its lower longitudinal edge by a bent back inner portion extending upwardly and inwardly of said main portion and having its upper longitudinal edge disposed above the level of the confronting face of said lower log, a flange extending from the upper longitudinal edge of said bent back portion and being downwardly inclined and directed towards said spacer blocks and towards the confronting face of said lower log, and a second terminal longitudinal edge portion formed at the outer free edge of said flange and engaging the groove of the lower log, said flange being spaced from said logs, so as to be free to change its angle relative to said main portion upon variations in the spacing between said logs, said first and said second terminal longitudinal edge portions being biased in respective engagement with the respective grooves of said logs, and said bent back portion being biased against the outer face of said lower log.

4,185,429

APPARATUS FOR WATERPROOFING A BASEMENT OR SIMILAR STRUCTURE

Salvatore Mendola, 4 Rota Dr., Sayreville, N.J. 08859

Filed Jul. 28, 1978, Ser. No. 928,985
Int. Cl.[2] E04B *1/70;* E04F *17/00*
U.S. Cl. 52—274 **10 Claims**

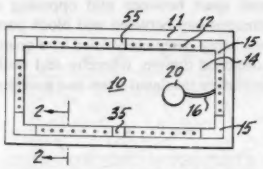
1. A drainage system for a foundation, comprising:

(a) a basement wall extending along a basement floor,

(b) a trench extending along the inner periphery of said wall and located between said wall and said floor,

(c) a first unitary longitudinal tubular member positioned in

said trench, said member having a top wall, a bottom wall and first and second side walls, with said top wall having a central region containing a plurality of apertures, with said central region communicating with the edges of said top wall by first and second sloping portions to enable water directed on said top wall to flow towards said



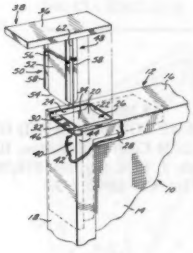
central region and only said first side wall having a plurality of apertures with said first side wall positioned in abutting relation with said basement wall, said tubular member as positioned in said trench being sloped to cause any water entering the hollow confines of said member via said apertures in either said top surface or said side walls to flow towards a collection site.

4,185,430

INTERCONNECTING MODULAR SCREEN ASSEMBLY

Clifford W. Gartung, Newport Beach, Calif., assignor to Pleion Corporation, Santa Ana, Calif.

Filed May 3, 1978, Ser. No. 902,731
Int. Cl.[2] E04B *1/82*; E04C *2/38*
U.S. Cl. 52—285 **15 Claims**



1. In an improved modular office screen system having a plurality of hollow rigid frame members, each frame member supporting a central panel member, the improvement comprising:

a horizontal section of each frame member having an aperture which comprises an entry into a vertically disposed channel, at least one wall of the channel being formed by a support member mounted within the frame member;

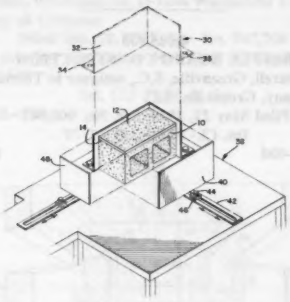
a fastener member configured for mounting within the vertically disposed channel of at least one frame member through the aperture and for being held therein by friction and being completely removable therefrom, the fastener member presenting a contiguous planar surface with the outer horizontal periphery of the horizontal section of the frame member, the fastener member also having means for interconnecting the frame member with at least another frame member to form a predetermined partition configuration.

4,185,431

FACED BUILDING UNIT

Robert O. Brownlee, 353 McDonald Ave., Mobile, Ala. 36604

Filed Nov. 10, 1977, Ser. No. 850,373
Int. Cl.[2] E04C *2/24*; C08K *3/00*; B28B *1/16*
U.S. Cl. 52—309.17 **9 Claims**



1. A cementitious facing composition for a building material comprising:

about twenty-five (25) parts by volume of a dry mixture in proportions of about 100 parts of portland cement and 200 parts of light aggregate;

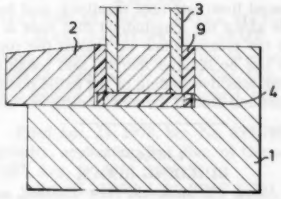
about four (4) parts by volume aqueous wetting agent to provide a composition having the consistency of soft putty when mixed with said mixture of cement and light aggregate, said wetting agent including an aqueous emulsion of 12.5 percent to 37.5 percent by volume of polymer resin solids derived from polymerizable vinyl compounds; said composition when applied as a coating and allowed to dry yielding a water-resistant, wear-resistant, tough and resilient facing having the appearance of cement, and having in the range of 1.96 to 5.66 percent by volume of resin solids retained in the cured composition.

4,185,432

ELEMENTS FOR SUPPORTING AND BRACING SEALED-GLAZING UNITS

Lars Eriksson, Storgatan 10, S-361 00 Emmaboda, Sweden

Filed Jan. 6, 1978, Ser. No. 867,366
Claims priority, application Sweden, Jan. 21, 1977, 7700609
Int. Cl.[2] E06B *7/16*; B23P *7/00*
U.S. Cl. 52—400 **7 Claims**



1. A supporting and bracing element adapted to engage an edge of a plate-like means received by glazing means, said element comprising:

two longitudinally extending edge ribs; and resilient, elastic body means arranged between said edge ribs and connected thereto in a manner such as to enable the distance between said edge ribs to be varied;

said body means comprising a plurality of web means operable to be resiliently and elastically deformed and elastically change said distance between said edge ribs; and

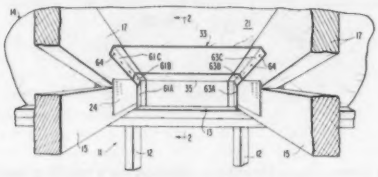
said body means being operable to be resiliently and elastically distorted, transversely of said edge ribs, with said body means thereafter resiliently and elastically tending to restore itself toward its original configuration due to its own resilience and elasticity and resiliently grip opposite sides of one of said glazing means and said plate-like means.

4,185,433

BAFFLE BOARD CONSTRUCTION

James E. Cantrell, Greenville, S.C., assignor to Thermal Insulation Company, Greenville, S.C.

Filed May 22, 1978, Ser. No. 908,503
Int. Cl.[2] E04B *2/00, 1/74*
U.S. Cl. 52—404 **12 Claims**



1. An insulation baffle board constructed for use in buildings of the type having upstanding walls provided with a horizontal top plate, and a roof provided with framing members which include horizontal ceiling joists and rafters inclined upwardly from said ceiling joists, ceiling means fixed to said ceiling joists and roof sheathing means affixed atop said roof rafters, said ceiling means and roof sheathing means defining an attic space, said ceiling joists and said roof rafters coming together and secured in the area of said top plate, and said roof rafters extending outwardly beyond said top plate forming eaves, said attic space and eaves being communicated by openings defined between adjacent pairs of roof framinig members, said baffle board comprising a generally rectangularly shaped piece of stiff material, said baffle board having a pair of longitudinal fold lines along one side and a pair of longitudinal fold lines along the other side thereof, said longitudinal fold lines extending the full length of said baffle board, at least one transverse fold line extending between the innermost ones of said longitudinal fold lines, and slits extending from the ends of said at least one transverse fold line to opposite side edges of said baffle board said baffle boards being foldable along said at least one transverse fold line and positionable in the openings communicating the attic space and eaves so that a first section from one end to said at least one transverse fold line extends generally vertically of said top plate, and a second section from said at least one transverse fold line to the other end extends generally along and spaced from said roof sheathing, said baffle board being foldable along the longitudinal fold lines at each side edge to form tab means which lie against the roof framing members and can be secured thereto, said longitudinal fold lines facilitating selective folding of the baffle board to selectively form first and second sections of different widths.

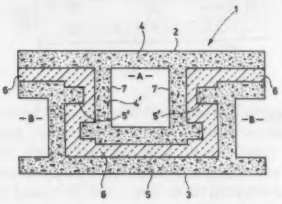
4,185,434

BUILDING BLOCK

Glyndwr M. Jones, Christchurch, New Zealand, assignor to Winstone Limited, Auckland, New Zealand

Filed Jan. 31, 1978, Ser. No. 873,866
Claims priority, application New Zealand, Feb. 3, 1977, 183252
Int. Cl.[2] E04C *2/29, 1/40*
U.S. Cl. 52—405 **2 Claims**

1. A wall construction of a plurality of building blocks each having opposing plane walls and opposing ends, each said block comprising first and second block parts respectively including said walls, one of said block parts of said each block having a portion projecting toward an inner surface of the other of said block parts of said each block, said portion lying centrally between said opposing ends and being of a first predetermined size and shape, said other block part of said each block having sections at said opposing ends extending toward an inner surface of said one block part of said each block, said sections being of a size and shape each equal to one-half said first size and shape, said block parts of said each block being entirely spaced apart between said opposing ends so as to define a continuous gap between said block parts, said gap of said each block being completely filled by a quantity of insulating material disposed therein, whereby said walls of said each block are completely insulated from one another by said insu-



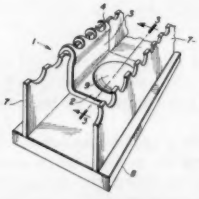
lating material extending continuously between said opposing ends, said plurality of blocks forming courses overlying each other to form the wall construction, said blocks of alternate ones of said courses being aligned therebetween, and said blocks of remaining ones of said courses being aligned therebetween but displaced relative to said alternate courses a distance equal to one-half that between said opposing ends, and one of said plane walls of said alternate courses and the other of said plane walls of said remaining courses lying in a common plane, whereby said opposing plane walls of the wall construction are continuously separated by said insulating material as said portions of one of said courses align with said sections of the other of said courses.

4,185,435

ANCHOR CLAMP FOR SERRATED GRATING

Albert Schiffers, Jr., 2324 Central, Evanston, Ill. 60201

Filed Feb. 3, 1978, Ser. No. 874,791
Int. Cl.[2] E04B *1/38*
U.S. Cl. 52—507 **3 Claims**



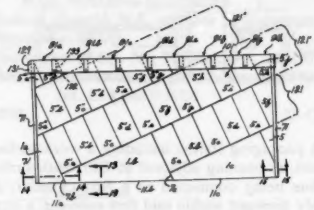
1. A clamp in combination with a serrated grating for securing said serrated grating to a support surface which is subject to vibrations comprising a serrated grating having a multiplicity of serrations and a clamp having a base, a generally upright surface projecting from one end of the base and terminating in an outwardly projecting open loop having a multiplicity of apertures at the topside for cooperation with the serrations of said grating, said apertures spaced a distance apart equal to the spacing of the serrations on the grating, means for securing the base portion to a support surface.

4,185,436

METAL SHINGLE ROOF TRADITIONAL DESIGN

Louis L. Vallée, 6392 Maubourg Ave., Montreal, Quebec, Canada (H1M 2C8)

Filed Mar. 31, 1978, Ser. No. 892,162
Claims priority, application Canada, Dec. 14, 1977, 293026
Int. Cl.² E04D *1/00*
U.S. Cl. 52—518 **20 Claims**



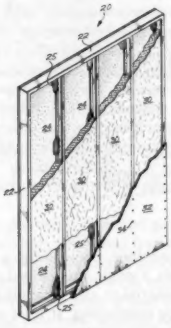
1. A sheet material starter shingle for use in shingling a roof with quadrangular roofing shingles of a certain length, the starter shingle having a first, long straight side adapted to receive a number of quadrangular roofing shingles of a certain length; second and third short, straight sides extending perpendicularly to the first side, the third side being substantially longer than the second side with a length at least equal to the length of a quadrangular roofing shingle; and a fourth long, straight side between the second and third sides, the fourth side adapted to be attached to the eave edge of a roof.

4,185,437

BUILDING WALL PANEL AND METHOD OF MAKING SAME

Ralph C. Robinson, Redmond, Wash., assignor to Olympian Stone Company, Redmond, Wash.

Filed Oct. 10, 1978, Ser. No. 949,696
Int. Cl.² E04C *2/02*
U.S. Cl. 52—601 **15 Claims**



1. A building wall panel comprising:

(a) a wall panel support frame formed from a plurality of metal vertical members each having a flange on at least one side thereof extending outwardly from the edges along the length of said member;

(b) a thin exterior facing formed from glass fiber reinforced concrete disposed across one side of said wall panel support frame and abutting a flange on each of said vertical members; and,

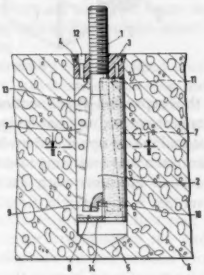
(c) a layer of glass fiber reinforced concrete overlaying a portion of the rear surface of said exterior facing and at least a portion of said flange abutting said exterior facing at intervals along the length of each of said vertical members, said layer bonding said exterior facing to said wall panel support frame.

4,185,438

ELEMENT FOR AND A METHOD OF MOUNTING AN OBJECT TO A SUPPORT STRUCTURE

Artur Fischer, Weinhalde 34, D-7244 Waldachtal 3 (Tumlingen), Fed. Rep. of Germany

Filed Sep. 29, 1978, Ser. No. 947,704
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1977, 2745438
Int. Cl.² F16B *13/04*
U.S. Cl. 52—704 **21 Claims**



1. A mounting element for mounting an object to a support structure provided with a mounting hole having an axis, comprising a leading anchoring portion arranged to be received into the mounting hole of the support structure and to be anchored therein by introducing a hardenable binding material into the mounting hole, said anchoring portion having leading and trailing ends and a cross-section increasing in the direction toward said leading end; a trailing mounting portion connected with said anchoring portion at said trailing end and arranged to extend outwardly beyond the mounting hole so as to mount an object thereon; and separating means associated with said anchoring portion to subdivide the mounting hole into at least two chambers spaced from one another in a direction transverse to the axis of the mounting hole, whereby the hardenable binding material, after being hardened in the chambers of the thus-divided mounting hole forms at least two substantially rigid bodies which spread apart from one another by said anchoring portion when a force is applied to the mounting element.

4,185,439

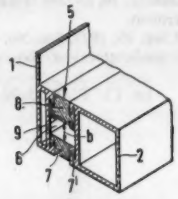
CONNECTING ELEMENT AND A METHOD OF MANUFACTURE THE SAME

Klaus Bischlipp, Hasslinghausen; Werner Weitzel, and Walter Hueck, both of Luedenscheid, all of Fed. Rep. of Germany, assignors to Eduard Hueck, Luedenscheid, Fed. Rep. of Germany

Filed Apr. 25, 1978, Ser. No. 899,789
Claims priority, application Fed. Rep. of Germany, May 12, 1977, 2721367; Aug. 11, 1977, 2736151
Int. Cl.² E04B *1/62*; E04C *3/29*
U.S. Cl. 52—731 **33 Claims**

1. A method of manufacturing a connecting element, particularly for windows, door and the like, comprising the steps of providing two elongated profiled elements; positioning said elongated profiled elements so that they are laterally spaced from one another and bound with one another an elongated channel having an upper section and a lower section which are spaced from each other in an upright direction; supplying a hardenable heat insulating material into at least a portion of the length of said lower section of said channel; thereafter inserting a transverse member extending over at least said portion

between said elongated profiled elements only at a lowermost location of said upper section and at a distance from said lower section so as to bound a hollow intermediate space therebetween and to separate said upper section from said intermediate space, and fixing said transverse member to said elongated profiled elements; supplying the hardenable heat insulating



material into the thus-separated upper section of said channel so as to fill said upper section; and hardening the hardenable heat insulating material in said upper and lower sections of said channel so as to form two heat insulating inserts which connect said elongated profiled elements with each other and are spaced from one another in the upright direction by said intermediate space.

4,185,440

METHOD OF AND PARTS USED IN THE CONSTRUCTION OF A PRESTRESSED CONCRETE STRUCTURE

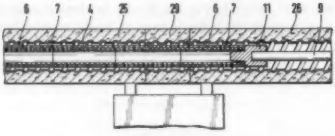
Ulrich Finsterwalder, Munich, Fed. Rep. of Germany, assignor to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 17, 1978, Ser. No. 897,122

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1977, 2717869

Int. Cl.² E04B *1/06*

U.S. Cl. 52—741 **15 Claims**



1. Method of constructing a longitudinally extending structure of prestressed concrete comprising building formwork for at least a longitudinally extending portion of the structure, placing at least one thin-walled sheathing tube into the formwork extending in the longitudinal direction for forming a duct extending therethrough, pouring concrete into the formwork and incorporating a sheathing tube therein, inserting a tendon into the duct formed by the sheathing tube after the concrete has set for a desired period and tensioning the tendon, wherein the improvement comprises stiffening the sheathing tube before pouring the concrete by inserting smooth-walled tubes of plastic or the like through the sheathing tube for the length thereof to be incorporated into the concrete and fitting the smooth-walled tubes within the sheathing tube with little play therebetween, retaining the smooth-walled tubes within the sheathing tube during the placing and setting of the concrete, and axially displacing the smooth-walled tubes out of the sheathing tube so that the tendon can be inserted therein and subsequently tensioned.

4,185,441

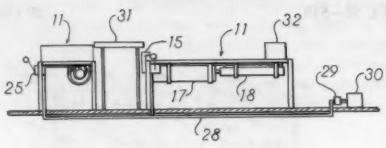
PACKAGING STATION

William H. Hoyt, P.O. Box 551, Choteau, Mont. 59422

Filed Mar. 6, 1978, Ser. No. 883,909

Int. Cl.² B65B *31/04*

U.S. Cl. 53—79 **10 Claims**



1. A packaging station including a work surface, a vacuum line with an opening adjacent to said work surface, said vacuum line being connected to a first cylinder, a first piston movably disposed within said first cylinder, a second cylinder located adjacent to said first cylinder, a second piston movably disposed within said second cylinder and operatively connected to said first piston, means for providing a fluid under pressure to said second cylinder, and control means for controlling the flow of said fluid selectively to said second cylinder on one side of said second piston therein.

4,185,442

REEL CHANGING DEVICE FOR WRAPPING MACHINES

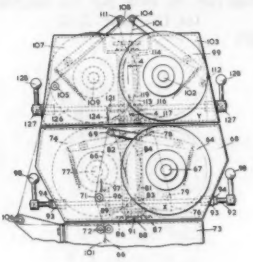
Reginald F. Johnson, Lea, near Gainsborough, and Ronald Cawte, Gainsborough, both of England, assignors to Baker Perkins Holdings Limited, Peterborough, England

Filed May 25, 1978, Ser. No. 909,676

Claims priority, application United Kingdom, Nov. 28, 1977, 49437/77

Int. Cl.² B65B *41/16, 41/12*

U.S. Cl. 53—168 **5 Claims**



1. A wrapping machine comprising a machine frame, a wrapping mechanism, a single pair of feed rollers for feeding a web of wrapping material to said wrapping mechanism, and a reel changing device comprising at least one turret rotatably mounted on the machine frame, mountings on the turret for supporting two reels of wrapping material, guiding means mounted on the turret for guiding the wrapping material from the two reels to respective separate and diametrically opposite draw-off points, the turret being rotatable with respect to the machine frame between alternative positions, in one of which the draw-off point of one of said wrapping materials is positioned adjacent said single pair of feed rollers and in the other of which the draw-off point of the other of said wrapping materials is positioned adjacent said single pair of feed rollers, and means for locking the turret to the machine frame in each of its two alternative positions, said mountings extending perpendicular to the axis of rotation of the turret, with one mounting projecting from one side of the turret and the other mounting projecting from the other side of the turret, so that, wher

wrapping material is being withdrawn from one of said reels by said feed rollers, the other mounting is accessible to enable the wrapping material from the other of said reels placed thereon to be fed through its respective guiding means to its respective draw-off point for use when said one reel is exhausted.

4,185,443

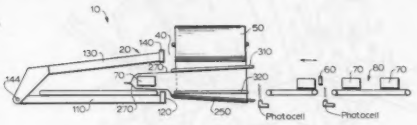
BAG SEALING MACHINE

Boleslaw L. Budzyn, Passaic, N.J., assignor to Weldotron Corporation, Piscataway, N.J.

Continuation-in-part of Ser. No. 735,036, Oct. 22, 1976, abandoned. This application Oct. 20, 1977, Ser. No. 843,871

Int. Cl.[2] B65B *9/08*

U.S. Cl. 53—550 **28 Claims**



1. An L-sealer comprising

a horizontal surface for supporting a product wrapped in a plastic bag to be sealed on two sides to form a closed package, said surface defining a path of travel for products and packages,

a first rectangular frame carrying an L-shaped sealing bar and positioned above said path of travel and said surface,

a second rectangular frame having an L-shaped supporting surface positioned beneath said surface and cooperating with said L-shaped sealing bar during a sealing operation,

said first and second rectangular frames both being pivotably mounted about an axis disposed transverse to said path so that they can be raised and lowered with respect to said surface during the performance of a sealing operation, with said first frame moving up and down above said path and said surface, and said second frame moving up and down below said path and said surface,

said first frame including front and rear members, which are parallel to each other and transverse to said path of travel, and left and right side members which are parallel to each other and to said path of travel,

said second frame including front and rear members which are parallel to each other and transverse to said path of travel, and left and right side members which are parallel to each other and to said path of travel,

a first horizontal support shaft, disposed transverse to said path of travel,

an air cylinder having its movable piston secured to said support shaft,

said frames being pivotably mounted generally about their rear members so that, when said frames are pivoted, said front members move toward and away from each other,

a first rigid bar secured between the ends of said shaft and the ends of the front member of said first frame, and

a linkage, including two bars, secured between the ends of said shaft and the front member of said second frame whereby movement of said piston of said air cylinder in one direction causing said frames to close on each other, and movement of said piston in the opposite direction causing said frames to move apart.

4,185,444

ALUMINUM PACK TREE

Chester S. Conken, 20195 SE. Highway 212, Boring, Oreg. 97009

Filed Apr. 25, 1977, Ser. No. 790,452

Int. Cl.[2] B68C *1/00*

U.S. Cl. 54—37 **4 Claims**

1. A pack tree for supporting and distributing the weight of a load between the front and rear haunches of a pack animal, said pack tree comprising:

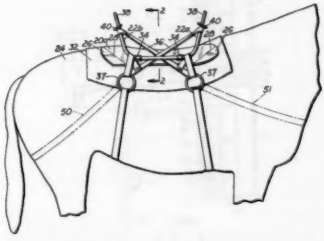
(a) a pair of elongate sideplates each having substantially flat upper and lower surfaces, a front portion and a rear portion;

(b) a pair of retaining members each comprising a pair of spaced apart retention brackets, each of said brackets being mounted on the upper surface of a respective one of said sideplates adjacent a respective one of said front and rear portions thereof and having a bore formed therethrough in parallel relation to the longest dimension of said sideplate;

(c) a pair of generally C-shaped frame members each pivotably extending through the bores of a respective one of said retaining members and each said frame member having its ends extending upwardly from the upper surface of one of said sideplates;

(d) a pair of generally omega-shaped partially deformable loop members, a first one of said loop members having its ends connected to the respective ends of said frame members extending upwardly from said front portions of said sideplates and a second one of said loop members having its ends connected to the respective ends of said frame members extending upwardly from said rear portions of said sideplates;

(e) a pair of reinforcing rings, a first ring disposed on said first loop member intermediate the ends thereof and a second ring disposed on said second loop member intermediate the ends thereof, so as to limit deformation of said loop members under loading; and



(f) flexible strap means for providing additional load support, and for attaching belly bands and britching and breast straps to said pack tree for use of said pack tree on pack animals of different sizes, said flexible strap means comprising first and second pairs of connecting means, with one pair on each side of the pack animal, for connecting said belly bands and britching and breast straps to said flexible strap means, and similar but oppositely oriented first and second strap members movably fastening said first and second pairs of connecting means to said pack tree; said first and second strap members each comprising first and second strap loops interconnected by an elongate portion, said first strap loop of said first strap member being disposed about both a first one of said first pair of connecting means and a first one of said frame members near said front portion of a first one of said pair of sideplates, said elongate portion extending from said first strap loop upwardly between said ends of said first one of said frame members and further being looped around the respective ends of said frame members extending upwardly from said rear portion of said sideplates and being crossed over itself between said upwardly extending ends of said frame members, said elongate portion further extending downwardly on the other side of the pack animal between said ends of said second one of said frame members to said second strap loop of said first strap member, said second strap loop being disposed about both a first one of said second pair of connecting means and a second one of said

frame members near said front portion of the second one of said pair of sideplates, said second strap member being oppositely disposed with respect to said pack tree, having first and second strap loops disposed respectively about a second one of each of said pairs of connecting means and a respective frame member near said rear portions of respective ones of said sideplates, and having an elongate portion looped around the respective ends of said frame members extending upwardly from said front portion of each of said sideplates and crossing over itself between said upwardly extending ends of said frame members.

4,185,445

MOWING MACHINE

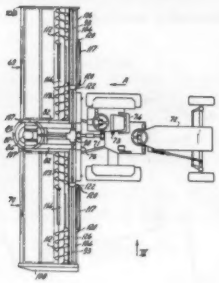
Cornelis van der Lely, 7 Bruschenrain, Zug, Switzerland

Filed Apr. 25, 1977, Ser. No. 790,687

Claims priority, application Netherlands, Apr. 27, 1976, 7604451

Int. Cl.[2] A01D *55/00, 57/26*

U.S. Cl. 56—6 **5 Claims**



1. A mowing machine comprising a frame extending transverse to the operative direction of travel and coupling means at the rear of said frame with respect to the machine's operative direction of travel, said coupling means adapted to be connected to a coupling device mounted on the front of an agricultural tractor, the machine comprising at least two groups of cutting means at the forward end thereof which are supported on said frame, said groups of cutting means comprising mowing units at least one of which is rotatable about a substantially vertical axis, the width of the working area of said groups of cutting means extending in excess of the width of said tractor on both sides thereof, movable conveyor means being supported on said frame to extend laterally of the machine behind said cutting means, driving means connected to operate said cutting means and said conveyor means to displace cut crop from said cutting means into two discharge areas of said conveyor means, each said discharge area having a width which is smaller than the width of each of said groups of cutting means on both sides of said tractor, each said discharge area being located to discharge cut crop therefrom on a side relative to the tractor as seen in the operative direction of travel proximate a wheel of said tractor, a crushing device being connected with said driving means and being located immediately behind each said discharge area of said conveyor means, each said crushing device adapted to form a swath of cut crop, wherey a swath of cut crop is formed at each side of the tractor.

4,185,446

BALE-FORMING DEVICE

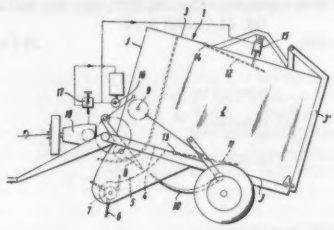
Gerhard Clostermeyer, Gutersloh, and Heinz Jaross, Harsewinkel, both of Fed. Rep. of Germany, assignors to Gebr. Claas Maschinenfabrik, GmbH, Harsewinkel, Fed. Rep. of Germany

Filed Nov. 23, 1977, Ser. No. 854,496

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1976, 2653318

Int. Cl.[2] A01O *87/00*

U.S. Cl. 56—344 **12 Claims**



1. A mobile baler for hay or like crop material, comprising a baling chamber defining an inlet opening and a bale discharge gate opposite said inlet opening; pick up means including means for feeding the picked up crop material into said inlet opening under a feeding pressure; and openable holding means arranged in said baling chamber between said inlet opening and said discharge gate to stop the incoming crop material until it reaches a predetermined baling pressure and subsequently to pass the baled material towards said discharge gate.

4,185,447

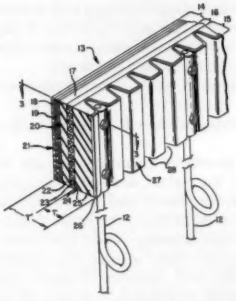
HAY CONVEYING BELT AND HAY RAKE

Anderson W. Howerton, and Lee R. Burris, both of Nixa, Mo., assignors to Dayco Corporation, Dayton, Ohio

Filed Apr. 27, 1978, Ser. No. 900,677

Int. Cl.[2] A01D *43/02*

U.S. Cl. 56—376 **15 Claims**



1. The combination of a belt and a working element comprising

(a) an endless belt made primarily of elastomeric material, having an inner compression section, a load-carrying section and an outer tension section, and having at least one groove in said outer tension section of said belt disposed transverse to the endless path of said belt, wherein the innermost portion of said groove has an arcuate configuration,

(b) at least one working element,

(c) a first means for attaching said working element exteriorly to said belt, wherein the portion of said first means

contacting said groove substantially conforms to the configuration of said groove when said belt is straight, and

(d) a second means for fastening said first means to said belt.

4,185,448

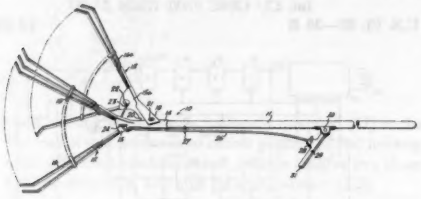
COMBINATION RAKE AND TRASH PICK-UP TOOL

Francisco Blanco, 501 NE. 69th St., Miami, Fla. 33138

Filed Sep. 5, 1978, Ser. No. 939,467

Int. Cl.[2] A01D *7/10*

U.S. Cl. 56—400.12 **1 Claim**



1. A combination rake and trash pick-up tool, comprising, in combination, an elongated rake handle, a main fanned spring finger rake head fixed at its apex and with respect to and extending outwardly of one end of said rake handle, a complementary auxiliary fanned spring finger rake head pivotally secured at its apex end with respect to said one end of said rake handle and movable between open and clamping jaw-like relation with respect to said main rake head for picking up trash piles, and remotely controllable means for moving said auxiliary fan spring finger rake head between said open and clamping positions, outer end portions of the individual spring fingers of each of said main and auxiliary rake heads being obtusely bent towards each other, said main and auxiliary rake heads being slightly laterally offset with respect to one another, whereby the individual spring fingers of one of said rake heads are receivable between the spring fingers of the other of said rake heads when said rake heads are in relatively clamping position, said remotely controllable means comprising an operating lever pivotally connected at one end to said rake handle at an intermediate position therealong, pivot means at an intermediate position along said operating lever, and elongated interconnecting means secured at one end to said auxiliary rake head and pivotally connected at its other end to said pivot means, said interconnecting means comprising a length of spring wire fixed at one end to said auxiliary rake head and extending through an opening in said main rake head, and a relatively rigid control rod, one end of said control rod being linked to the other end of said spring wire, and the other end thereof being pivotally connected to said pivot means.

4,185,449

TRAVELLERS FOR RING SPINNING MACHINES

Brian K. M. Eadie, Brookfield; William H. C. Parker, Glasgow, and William A. White, Newton Nearns, all of Scotland, assignors to Eadie Bros. & Co., Limited, Victoria Works, Scotland

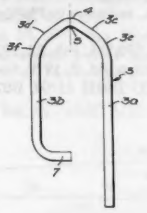
Filed Apr. 28, 1978, Ser. No. 901,218

Claims priority, application United Kingdom, May 14, 1977, 20350/77

Int. Cl.[2] D01H *7/60*

U.S. Cl. 57—125 **3 Claims**

1. An integral traveller for ring spinning machines comprising two parallel limbs joined at one end by a head symmetrically disposed between and with respect to said limbs and comprising two oppositely inclined converging straight sections meeting in single bearing surface means for yarn passing through said traveller consisting of an apex having an included angle in the range of about 110° to 120°, and there being an



inturned portion on the other end of one limb for engagement, in use, with a shoulder on the outer surface of said ring.

4,185,450

PROCESS FOR THE TEXTURIZATION OF POLYCAPRONAMIDE FIBRES AND TEXTURIZED POLYCAPRONAMIDE FIBRES OBTAINED ACCORDING TO THE PROCESS

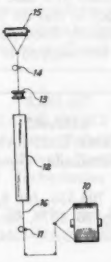
Pietro Moruzzi, Milan, and Francesco Cadau, Seveso Milan, both of Italy, assignors to Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

Filed Dec. 22, 1977, Ser. No. 863,310

Claims priority, application Italy, Dec. 24, 1976, 30851 A/76

Int. Cl.[2] D02G *1/02*

U.S. Cl. 57—247 **13 Claims**



1. In a process for making texturized polycapronamide yarn from a substantially unoriented polycapronamide yarn comprising the steps of drawing, sufficient to set the false twist, the improvement comprising starting up said process by conducting only one of the following steps for a period of time equivalent to the time sufficient for setting to occur when the yarn is completely drawn:

(A) Concurrently false twisting and drawing at the conditions utilized during table operations by feeding the yarn at a positive high speed, said false twisting being carried out in a zone between the point at which the yarn is fed and the point at which it is taken up; and

(B) Concurrently drawing at the draw ratio utilized during stable operation, by feeding the yarn at a positive lower speed and taking up said yarn at a positive high speed, setting said yarn by heating in a zone maintained at the temperature utilized during stable operation, between the point at which the yarn is fed and the point at which it is taken up;

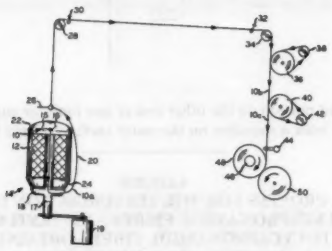
followed by beginning the remaining steps of heating or false twisting, respectively, while continuing the steps already begun.

9. Polycapronamide texturized yarn, made by the process of claim **1**.

4,185,451
APPARATUS AND PROCESS SUITABLE FOR TWIST-DRAWING A YARN

Charles S. Hatcher, Greenville, S.C., and Kenneth E. Smith, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 770,551, Feb. 22, 1977, Pat. No. 4,112,667. This application Jul. 7, 1978, Ser. No. 922,480
Int. Cl.[2] D01H *13/04;* D02G *3/00*
U.S. Cl. 57—310 4 Claims

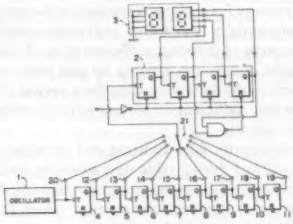


1. Apparatus comprising:
2-for-1 twist spindle;
at least one guide roll positioned to receive yarn from said twist spindle;
means suitable for receiving a yarn from said guide roll and drawing the yarn; and
means suitable for winding the drawn yarn wherein the guide roll comprises a cylindrical surface mounted on a shaft which is attached to a base suitable for positioning the cylindrical surface so that the yarn rides on the surface of the roll in a relatively fixed position and a substantial amount of twist is not trapped in the yarn ahead of the guide roll.

4,185,452
DIGITAL TIME DISPLAY SYSTEM

Arihiko Ikeda, 5-1, Komakado, Gotemba-shi, Sizuoka-ken, Japan (412)

Continuation of Ser. No. 703,336, Jul. 8, 1976, abandoned. This application May 10, 1978, Ser. No. 904,642
Int. Cl.[2] G04C *3/00;* G04F *10/04*
U.S. Cl. 58—23 R 2 Claims

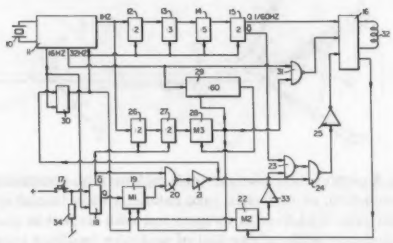


1. A digital display system comprising a numerical display unit, and a circuit arrangement for producing outputs which drive the display unit, said numerical display unit comprising a pair of "new second" display elements, a pair of "new minute" display elements, and at least one hour display element, the least significant digit in the numerical display unit being one of the digits in the "new second" display elements, said circuit arrangement comprising first means for stepping the "new second" display elements every 0.36 seconds and for stepping the digits displayed by the "new second" display elements and the "new minute" display units to the scale of 100, said circuit arrangement also comprising second means for stepping the least significant digit in the numerical display unit at a rate corresponding to one step per one second, and means for selectively switching between the first and second means.

4,185,453
TIME SETTING AND CORRECTING CIRCUIT FOR ELECTRONIC TIMEPIECES

Jean-Pierre Jaunin, Nidau, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Switzerland

Filed Oct. 17, 1977, Ser. No. 843,003
Claims priority, application United Kingdom, Oct. 25, 1976, 44231/76
Int. Cl.[2] G04C *9/00;* G04B *27/00*
U.S. Cl. 58—35 R 10 Claims



1. In an electronic timepiece having a quartz crystal time standard, a stepping motor for applying driving motion to coupled minute and hour indicating hands, and multistage frequency dividing means responsive to signals from said time standard for applying stepping signals at a predetermined first frequency to said stepping motor, the improvement comprising a time setting and correcting circuit including:
a single user-actuable switch;
a first memory means;
timing means responsive to said switch for setting said first memory means after actuation of said switch for a predetermined interval of time;
circuit means responsive to said frequency dividing means and said first memory means for applying supplemental stepping signals to said motor at a second frequency higher than said first frequency;
counter means connected to said first memory means and said frequency dividing means for counting said supplemental signals of said second frequency, said counter having an output connected to reset said first memory means when said counter means reaches a predetermined count; and,
means responsive to said switch for applying at least one supplemental stepping signal to said motor upon actuation of said switch for less than said predetermined interval of time.

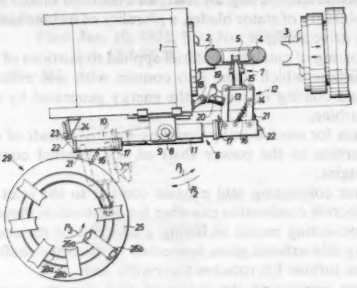
4,185,454
LINK STUD INSERTER

Rolf Bergström, and Stig Svensson, both of Ramnäs, Sweden, assignors to Bulten-Kanthal AB, Hallstahammar, Sweden

Filed Jun. 12, 1978, Ser. No. 914,819
Claims priority, application Sweden, Jun. 17, 1977, 7707079
Int. Cl.[2] B21L *11/14*
U.S. Cl. 59—1 14 Claims

1. A device for inserting a link stud (5) into a chain link (4) to permit a subsequent fastening of the link stud in the chain link, comprising
(a) a pivotably mounted arm (6) operatively connected to a stud fastening station (2,3), said arm carrying at its free end an operable holding means (7) for holding said link stud (5) and being pivotable between a collecting position

adjacent a link stud feeding device (25) and a delivery position adjacent said stud fastening station (2,3),



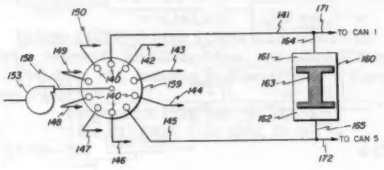
(b) said holding means being resiliently mounted (12) at the free end of said arm so as to enable guiding of said holding means (7) into a predetermined position relative to a chain link (4) situated in said stud fastening station (2,3).

4,185,455

FUEL PULSATION-SUPPRESSION FOR GAS TURBINE COMBUSTION SYSTEM

Sudhir D. Savkar, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 2, 1977, Ser. No. 830,112
Int. Cl.[2] F02C 7/22; F04B 11/00
U.S. Cl. 60—39.06 7 Claims



1. The method of suppressing pulsations in the combustors of a gas turbine comprising:

distributing fuel from a fuel flow divider to each of said combustors, respectively, through a plurality of fuel lines, respectively, said flow divider supplying fuel to each fuel line at a predetermined flow rate with sinusoidal pressure fluctuations;

identifying, for each of said plurality of fuel lines, pairs of said fuel lines in which said sinusoidal pressure fluctuations are approximately 180° out of phase with each other; and

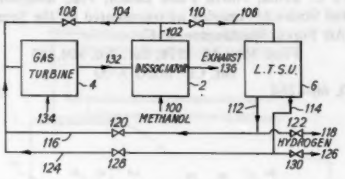
at a location along each of said pairs of said fuel lines intermediate said flow divider and said combustors, directing fuel from each fuel line, respectively, in each pair of fuel lines, respectively, toward one of a pair of interconnected chambers, respectively, of variable volume dependent only upon instantaneous pressure differential between said each pair of fuel lines, whereby said sinusoidal pressure fluctuations are substantially eliminated in each of said fuel lines.

4,185,456

PROVIDING ENERGY FROM THE COMBUSTION OF METHANOL

Donald R. Cummings, Anchor Cottage, Coln St. Dennis, Cheltenham, Gloucestershire, England

Filed Jun. 27, 1977, Ser. No. 810,389
Claims priority, application United Kingdom, Jul. 2, 1976, 27712/76; Jul. 2, 1976, 27713/76; Jul. 2, 1976, 27714/76; Apr. 19, 1977, 16207/77
Int. Cl.[2] F02C 3/22
U.S. Cl. 60—39.02 15 Claims



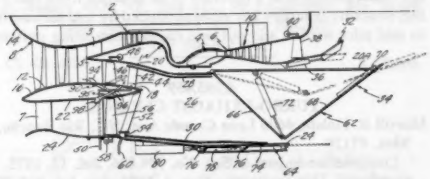
1. A process for providing from methanol both power and a process or fuel gas comprising carbon monoxide and hydrogen, the process comprising at least partialiy disssociating the methanol into carbon monoxide and hydrogen by contacting said methanol at elevated temperature with a catalyst for the dissociation which is selected from catalysts for the reverse reaction of forming methanol from carbon monoxide and hydrogen, and providing said process or fuel gas from a first part of the at least partially dissociated methanol, energy for the dissociation being provided from the heat in the hot gases of combustion from a gas turbine fueled by a second part of the at least partially dissociated methanol.

4,185,457

TURBOFAN-RAMJET ENGINE

Sidney D. Parker, Lake Park; Robert G. Carroll, West Palm Beach, and William L. Howell, North Palm Beach, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 28, 1976, Ser. No. 653,187
Int. Cl.[2] F02K 3/06; F02C 7/02
U.S. Cl. 60—204 7 Claims



5. A method of operating a turbofan-ramjet engine having a core engine and an annular fan duct and ram duct located therearound having a common annular combustion chamber, said core engine and said common combustion chamber each having means for controlling the flow therefrom, the steps of:

(1) operating the engine for turbofan operation with no duct burning by

(a) blocking the flow through said ram duct;

(b) flowing air through said fan duct; and

(c) controlling the flow from said common annular combustion chamber;

(2) operating the engine for turbofan operation with duct burning by

(a) providing burning within said common annular com-

bustion chamber while swirling the air flowing through the fan duct at a desired angle of swirl;

(3) operating the engine for ramjet operation by

(a) blocking the flow through said core engine;

(b) blocking the flow through said fan duct; and

(c) providing burning within said common annular combustion chamber while swirling the air flowing through the ram duct at a desired angle of swirl.

4,185,458

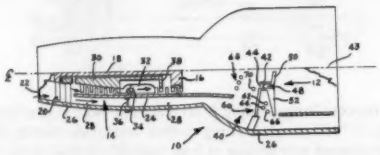
TURBOFAN AUGMENTOR FLAMEHOLDER

Richard C. Ernst, North Palm Beach, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 11, 1978, Ser. No. 904,850

Int. Cl.[2] F02G *3/00*

U.S. Cl. 60—261 **3 Claims**



1. In a turbofan engine having a casing enveloping a compressor, combustor, turbine and augmentor in axial flow relationship, the improvement therein being in the form of a flameholder located in said augmentor of said turbofan engine downstream of said turbine, said flameholder comprising a hollow ring-like structure of annular configuration concentric with the centerline of said turbine, said ring-like structure being open in the direction of said turbine forming a pilot section, a first group of radially disposed hollow gutters extending from said ring-like structure in a direction toward the centerline of said turbine, a second grip of radially disposed hollow gutters extending from said ring-like structure in a direction away from the centerline of said turbine toward said casing of said turbofan engine, an aperture located in said ring-like structure aligned with each of said gutters interconnecting said pilot section with said gutters, said second group of gutters having a vee-shaped angular configurated portion in a direction toward said turbine, said angular configurated portion gradually increasing in angle size along said gutter in the radial direction as a function of its distance from said ring-like structure whereby hot gases produced by said turbine flow to said pilot section and out said radially extending gutters.

4,185,459

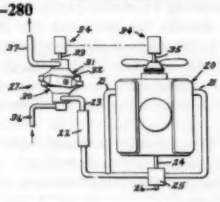
TURBO-EXHAUST CLEANER

Merrill R. Holste, 4600 Leon Grande Ave., SE., Rio Rancho, N. Mex. 87124

Continuation-in-part of Ser. No. 596,896, Jul. 17, 1975, abandoned. This application Dec. 1, 1978, Ser. No. 965,276

Int. Cl.[2] F02G *5/00*

U.S. Cl. 60—280 **9 Claims**



1. In combination: an internal combustion engine having a power shaft and an exhaust conduit for conducting exhaust gas away from said internal combustion engine;

a discrete combustion chamber having an inlet and outlet;

a gas turbine having an inlet, an outlet, an intake nozzle, a plurality of stator blades, a plurality of turbine blades, and a drive shaft;

a coating of catalytic material applied to portions of said gas turbine which come into contact with said exhaust gas, said coating increasing the energy generated by said gas turbine;

means for mechanically coupling the drive shaft of said gas turbine to the power shaft of said internal combustion engine;

means connecting said exhaust conduit to the inlet of said discrete combustion chamber for combustion therein, said connecting means including a compressor for compressing said exhaust gases connected to the drive shaft of said gas turbine for rotation therewith; and

means connecting the outlet of said discrete combustion chamber to the inlet of said gas turbine whereby the combusted gases leaving said discrete combustion chamber drive said gas turbine, and whereby the energy produced by said gas turbine is coupled to said power shaft to increase the efficiency of said internal combustion engine.

4,185,460

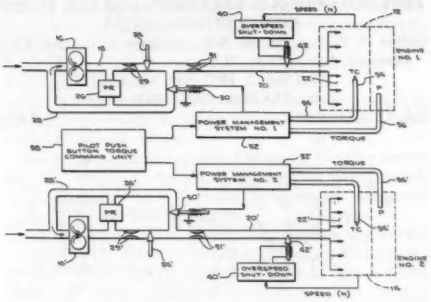
ENGINE POWER MANAGEMENT SYSTEM

M. Samuel Moore, and Charles F. Paluka, both of Northridge, Calif., assignors to Semco Instruments, Inc., North Hollywood, Calif.

Filed Dec. 27, 1977, Ser. No. 864,857

Int. Cl.[2] F02K *3/12*; F02C *9/04*

U.S. Cl. 60—224 **25 Claims**



1. A fail-safe turbine engine power management system comprising:

a turbine engine;

a principal fuel supply path from the fuel pump to the turbine engine fuel nozzles;

a by-pass fuel control line for selectively diverting a portion of the fuel from said principal fuel supply path;

a power management system valve for controlling fuel flow through said by-pass line;

means for normally mechanically biasing said control valve into the closed position;

means for measuring the output power of said engine;

push-button type control means for selecting the desired operating power for said engines, said push-button control means including means for selecting at least three different discrete power levels with the turbine engine running;

electronic circuit means for providing an output power control signal for varying the position of said control valve; and

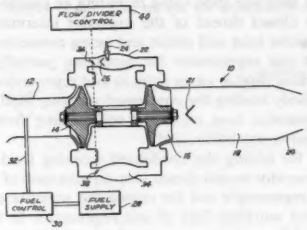
means for varying said control signal and the resultant fuel flow as a function of the difference between the measured output power and the preselected desired output power.

4,185,461

TURBOJET ENGINE WITH COMBUSTOR BYPASS

David B. Wilkinson, Xenia, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 10, 1978, Ser. No. 868,359
Int. Cl.[2] F02K *3/10, 1/02*
U.S. Cl. 60—261 2 Claims



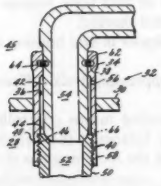
1. A propulsion system, comprising: a turbojet engine including a compressor; a turbine mechanically coupled to said compressor; a combustion chamber interconnecting the output of the compressor and the input of said turbine; an afterburner connected to the output of said turbine; an exit nozzle connected to the output of said afterburner; means for supplying fuel to the input of said compressor; means for igniting the fuel-air mixture within said combustor; a flameholder within said combustor; a combustor bypass duct connected between the compressor outlet and the input of the turbine; means for controlling the portions of the compressor output flow passing through the combustion chamber and the combustor bypass duct.

4,185,462

FLUID FITTING FOR TURBOFAN ENGINES

Robert A. Morse, II, Amesbury, Mass., and Alfred J. Rondina, Jr., Pensacola, Fla., assignors to General Electric Company, Lynn, Mass.

Filed Apr. 5, 1978, Ser. No. 893,553
Int. Cl.[2] F02K *3/10;* F16L *55/00*
U.S. Cl. 60—261 6 Claims



1. For use in a gas turbine engine having a plenum of pressurized fluid flowing therein the invention comprising:

first and second fluid carrying members disposed in said plenum and adapted to carry a second fluid; p1 clamping means for maintaining said members engaged at a substantially fluid-tight joint, said joint disposed in said plenum;

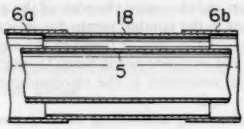
means disposed between said plenum and said joint for establishing a fluid leakage path for said second fluid, said path extending from said joint to a location exterior to said plenum, said exterior location disposed at a pressure lower than the pressure in said plenum.

4,185,463

EXHAUST DOUBLE PIPE OF AN INTERNAL COMBUSTION ENGINE

Toshio Tanahashi, and Yasuo Fujioka, both of Toyota, Japan, assignors to Toyota Jibosha Kogyo Kabushiki Kaisha, Toyota, Japan

Division of Ser. No. 704,510, Jul. 12, 1976, Pat. No. 4,142,366.
This application Dec. 20, 1978, Ser. No. 971,239
Claims priority, application Japan, May 18, 1976, 51-56025
Int. Cl.[2] F01N *7/00*
U.S. Cl. 60—322 1 Claim



1. A double-walled exhaust pipe for use with an internal combustion engine of a vehicle comprising:

an inner exhaust pipe having first and second ends,

an outer pipe assembly surrounding said inner pipe, said outer pipe assembly comprising first and second outer pipes, each having inner and outer ends, said inner end of said first outer pipe being coupled to said inner end of said second outer pipe, wherein the coupling between said first and second outer pipes is a tubular spacer fitted into the inner ends of said first and second outer pipes, and allows sliding movement between one of said outer pipes and said spacer, said spacer comprising a straight pipe, one end of which is welded to said inner end of said first outer pipe, and the other end of which is slidably fitted into the inner end of said second outer pipe,

a first mounting flange, said outer end of said first outer pipe being welded to said first mounting flange together with said first end of said inner pipe, and

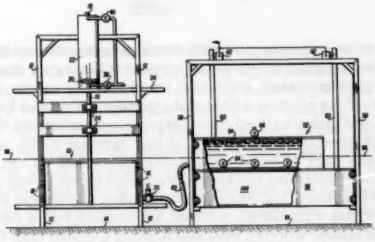
a second mounting flange, the outer end of said second outer pipe being welded to said second mounting flange together with said second end of said inner pipe.

4,185,464

OCEAN TIDE ENERGY CONVERTER HAVING IMPROVED EFFICIENCY

Don E. Rainey, 4529 NE. 21st Ave., Ft. Lauderdale, Fla. 33308

Filed Mar. 20, 1978, Ser. No. 888,020
Int. Cl.[2] F03B *13/12*
U.S. Cl. 60—496 8 Claims



1. A tide motor comprising

a primary piston including an enclosed chamber;

valve means for selectively providing communication between the lower area of the chamber and the ambient;

means connected to the primary piston arranged to convert motion of the primary piston to useful work;

locking means arranged to selectively lock the primary piston at lower and upper positions;

an auxiliary piston including a lower enclosed air chamber and an upper water chamber having a volume at least as great as the volume of the primary piston chamber, the air chamber being sufficiently large so that the auxiliary piston is positively buoyant when the water chamber is filled with water;

flood valves in the lower area of the water chamber;

means for selectively locking the auxiliary piston in its lower position;

fluid conduit means connected to and providing communication between the lower areas of the chamber of the primary piston and the water chamber of the auxiliary piston;

a valve means in the conduit means for selectively enabling or shutting off the flow of liquid in the conduit;

the primary and auxiliary piston being supported and guided for vertical movement in the environment of a body of tidal water; and

means for selectively controlling all of the recited locking and valve means.

4,185,465

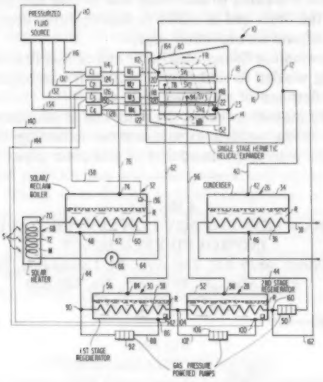
MULTI-STEP REGENERATED ORGANIC FLUID HELICAL SCREW EXPANDER HERMETIC INDUCTION GENERATOR SYSTEM

David N. Shaw, Unionville, Conn., assignor to Dunham-Bush, Inc., West Hartford, Conn.

Continuation-in-part of Ser. No. 782,675, Mar. 30, 1977, Pat. No. 4,086,072, which is a continuation-in-part of Ser. No. 653,568, Jan. 29, 1976, Pat. No. 4,058,988. This application Feb. 27, 1978, Ser. No. 881,449

Int. Cl.[2] F01K *7/34*

U.S. Cl. 60—678 **7 Claims**



1. In an expander powered electrical generator system including a helical screw rotary expander having an expander casing, intermeshed male and female helical screw rotors mounted for rotation within said expander casing and forming with said casing a closed thread expansion chamber and having a high pressure inlet port and a low pressure outlet port at opposite ends of said helical screw rotors, and an electrical induction generator mechanically coupled to one of said rotors of said expander and being driven thereby, said system further comprising a condenser, a boiler, and conduit means carrying a vaporizable working fluid and forming a closed loop circuit including in series, the expander, the condenser and the boiler, said expander casing further including at least one movable slide valve and forming a part of the envelope for said expansion chamber, and motor means for shifting said at least one valve in response to a system operating parameter, and means for pumping the condensate from the condenser to the boiler, means for adding thermal energy to the working fluid within said closed loop at said boiler and for removing thermal energy from said closed loop working fluid at said condenser to effect vaporization of said working fluid within said boiler and condensation of said working fluid within said condenser, the improvement comprising:

at least one regenerator within the closed loop between the condenser and the boiler and having a regenerator heat exchange coil carrying the working fluid passing from the condenser to the boiler,

said at least one slide valve including an ejection port open to a closed thread of the expander intermediate of the expander inlet and outlet and being connected to said at least one regenerator for supplying partially expanded working fluid in vapor form to said regenerator for regeneratively heating the condensed working fluid within said regenerator heat exchange coil passing from the condenser to the boiler, and

means for adding the condensed working fluid within the regenerator to said closed loop downstream of said at least one regenerator and for raising the pressure of said condensed working fluid of said regenerator to that of said closed loop.

4,185,466

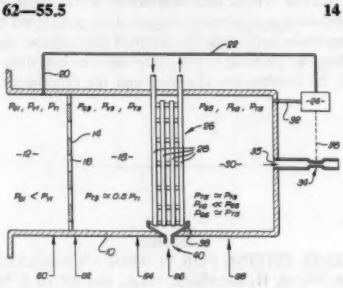
PARTIAL PRESSURE CONDENSATION PUMP

Eric P. Muntz, Pasadena, Calif., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed May 22, 1978, Ser. No. 891,667

Int. Cl.[2] B01D *5/00*

U.S. Cl. 62—55.5 **14 Claims**



1. In a partial pressure condensation pump for increasing the partial pressure of a gas or gases in a gas-vapor mixture while removing a vapor or vapors from the mixture, the combination of:

(a) a housing providing a flow passage having an inlet at the upstream end of said flow passage and an outlet at the downstream end thereof;

(b) a vapor condenser in said housing downstream from said inlet;

(c) means for suppressing back diffusion of gas toward said inlet; and

(d) outflow metering means controlling gas flow through said outlet for balancing the outgoing gas flow through said outlet and the incoming gas flow through said inlet.

4,185,467

ICEMAKER LIQUID REFRIGERANT DEFROST SYSTEM

Milton W. Garland, Waynesboro, Pa., assignor to Frick Comany, Waynesboro, Pa.

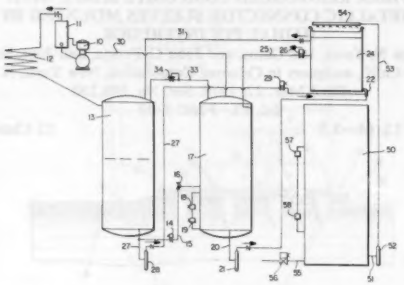
Filed Nov. 18, 1977, Ser. No. 852,763

Int. Cl.[2] F25B *41/00*; F25C *5/10*

U.S. Cl. 62—81 **10 Claims**

1. In a refrigeration system having compressing and condensing means, a liquid refrigerant receiver, and evaporator means, in which the evaporator means is in heat exchange relation with water in the frozen or unfrozen state in an ice-

maker and which water is frozen and harvested cyclically, the improvement comprising, a separator-accumulator, first warm liquid supply means connecting the receiver for fluid flow to said separator-accumulator, said evaporator having inlet and outlet means, second warm liquid supply means connecting the receiver to an inlet of the evaporator means for passing the liquid refrigerant from the receiver into heat exchange relation with the ice to be harvested in the icemaker, first and second valve means in said first warm liquid supply and said second warm liquid supply connecting means for selectively opening



or closing said connecting means, means connecting said separator-accumulator to an inlet means of said evaporator means for supplying relatively cool liquid refrigerant to said evaporator means in heat exchange relation with the water to be frozen in the icemaker, first return means connecting an outlet of said evaporator means to said separator-accumulator, said separator-accumulator connected to the suction of said compressing means, second return means connecting an outlet of the evaporator means to said receiver, and valve means controlling flow through said first return means.

4,185,468

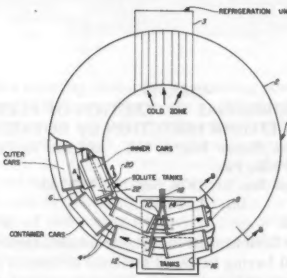
APPARATUS FOR SEPARATION, REFINEMENT, EXTRACTION AND/OR CONCENTRATION BY LIQUATION

Clyde M. Adams, Jr., 3509 Biddle St., Cincinnati, Ohio 45220

Continuation-in-part of Ser. No. 882,256, Feb. 28, 1978, abandoned. This application Jul. 13, 1978, Ser. No. 923,941

Int. Cl.[2] B01D *9/04*

U.S. Cl. 62—123 **8 Claims**



1. Apparatus for separating a substantially liquid mixture containing solvent and dissolved and/or undissolved foreign matter comprising:

means providing a long, tunnel-like and thermally insulated conduit defining a closed circular loop;

multiple conveyor means for carrying containers of the liquid through said conduit in opposite directions and in heat exchange relation to each other;

means gradually cooling said mixture in a quiescent and undisturbed state while the same is conveyed in said containers toward an intermediate zone within said conduit;

means for effecting removal of concentrated liquid rich in solute from spaces between solidified crystals of solvent as it is conveyed beyond said intermediate zone;

means located between said cooling means and removal means in the direction of travel of each conveyor means for recovering the relatively pure liquid resulting from continued melting of said crystals; and

means located ahead of the location of the last-mentioned means in the direction of travel of each conveyor means for refilling said containers with a substantially liquid mixture containing solvent and dissolved and/or undissolved foreign matter.

4,185,469

ENVIRONMENTAL CONTROL SYSTEMS

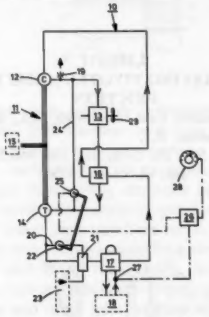
Brian H. Rogers, and Robin H. Thring, both of Yeovil, England, assignors to Normalair-Garrett (Holdings) Limited, Yeovil, England

Filed Jul. 29, 1977, Ser. No. 820,294

Claims priority, application United Kingdom, Aug. 6, 1976, 32965/76

Int. Cl.[2] F25B *45/00*

U.S. Cl. 62—174 **12 Claims**



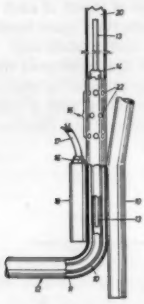
1. An environmental control system comprising a working gas circuit with an inlet path for admitting working gas to the circuit and an outlet path for removing working gas from the circuit; a compressor-expander arrangement including a compressor for compressing working gas in said circuit and an expander to expand the compressed working gas; first heat exchange means connected in said circuit to receive compressed working gas for heat exchange with a coolant and to discharge said gas to said expander; second heat exchange means connected in said circuit to receive expanded working gas from said expander and to discharge said gas to the compressor and being in heat exchange relationship with the environment to be controlled; means for regulating the mass of the working gas in said circuit; and means for controlling the temperature of the working gas, said mass regulating means and said temperature regulating means being responsive to thermal demands on the system.

4,185,470

RECTIFIER FOR ABSORPTION COOLING UNIT

Nicolas Eber, P.O. Box 130, CH-8103 Unterengstringen, Switzerland

Filed Aug. 16, 1977, Ser. No. 825,083
Claims priority, application Switzerland, Sep. 2, 1976, 011259/76
Int. Cl.[2] F25B *15/04*
U.S. Cl. 62—496 8 Claims



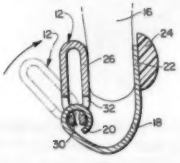
1. A rectifier for an absorption cooling unit comprising
a pair of concentrically disposed pipes defining a counter-current flow path therebetween for a downward flow of a liquid solution and an upward flow of a vapor mixture of a refrigerant and a solvent; and
a plurality of indentations in at least one of said pipes dividing each flow path into a plurality of small parallel passages, each having a cross-section with a maximum linear dimension of five millimeters, and simultaneously securing and fixing the mutual position of said pipes relative to each other.

4,185,471

EAR CLIP HAVING PIVOTED ARMS HELD BY FRICTION

Nazareno J. Saccoccio, East Greenwich, R.I., assignor to Aro-Sac Inc., Providence, R.I.

Filed Sep. 25, 1978, Ser. No. 946,209
Int. Cl.[2] A44C *7/00*
U.S. Cl. 63—14 C 10 Claims



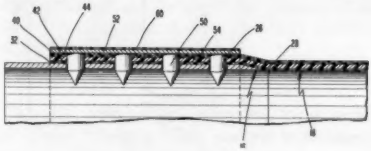
1. A clip for earrings and the like comprising a pair of pivotally connected members each having a portion adapted to engage respective opposite sides of a wearer's earlobe and movable to various positions wherein said members effect a clamping grip on said earlobe, one of said members being a spring member having arms terminating in opposed free ends, said arms including openings which are aligned to form a passage through said arms and disposed proximate said free ends thereof, the other of said members terminating in a loop portion at one end thereof, said loop portion passing through said openings and at least partially encircling said free ends and in contact therewith so as to place said free ends under tension and accordingly impart a frictional drag on said members during at least a portion of the respective pivotal movement thereof between said various positions.

4,185,472

FIBER REINFORCED COMPOSITE SHAFT WITH METALLIC CONNECTOR SLEEVES MOUNTED BY RADIAL PIN INTERLOCK

Derek N. Yates, Los Gatos, and John C. Presta, San Jose, both of Calif., assignors to Celanese Corporation, New York, N.Y.

Filed Mar. 27, 1978, Ser. No. 890,230
Int. Cl.[2] F16C *3/02*
U.S. Cl. 64—1 S 12 Claims



1. A tubular fiber reinforced composite shaft comprising:
a shaft body comprising a plurality of integrally bonded plies of solidified fiber reinforced resinous material;
a metal sleeve mounted in at least one end of said shaft body;
a plurality of pins extending through at least one of said plies and said sleeve, to create a torsion-transmitting connection between said shaft body and said sleeve; and
said pins being mounted on arch-shaped plates, said plates being arranged such that circumferential ends of said plates are disposed in substantially end-to-end relationship so as to form a substantially continuous circumferential surface;
an additional ply of solidified fiber reinforced resinous material extending around the said circumferential surface of said plates exteriorly of previously applied fibrous material to retain said pins.

4,185,473

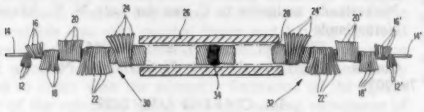
BALANCED TORSIONAL DEFLECTION OF FLEXIBLE SHAFTS IN EITHER DIRECTION OF ROTATION

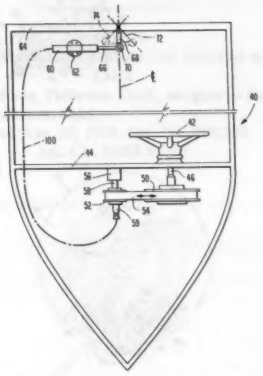
Robert C. Troost, Staten Island, N.Y., assignor to Pennwalt Corporation, Phila, Pa.

Filed Jun. 21, 1978, Ser. No. 917,763
Int. Cl.[2] F16C *1/02*
U.S. Cl. 64—2 R 6 Claims

1. A rotatable flexible shaft for remote control applications, said flexible shaft having balanced torsional deflection characteristics when rotated in either direction under torsional loads, said flexible shaft comprising,
a pair of interconnected equal lengths of flexible shafting, each of said interconnected flexible shafting lengths comprising,
a wire mandrel,
a plurality of layers of wire wound tightly over said mandrel, each of said plurality of layers of wire of each of said

interconnected shafting lengths being successively wound in alternately opposing directions, and





each respective layer of wires of each of said interconnected shafting lengths being of identical construction and having an opposite lay.

4,185,474

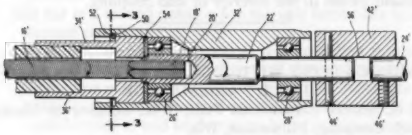
SAFEGUARD COUPLING FOR POWER DRIVEN FLEXIBLE SHAFTS

Walter Kulischenko, East Brunswick, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Apr. 3, 1978, Ser. No. 892,630

Int. Cl.[2] F16C *1/06, 1/26*

U.S. Cl. 64—4 **2 Claims**



1. In a coupling device for transmitting power from a rotating flexible shaft to a spindle of a worktool, said device having a handpiece for manually holding said worktool by an operator, a coupling shaft axially rotatably mounted within said handpiece for axially interconnecting said flexible shaft and said worktool spindle, said flexible shaft having a casing within which said flexible shaft rotates, a ferrule for tightly gripping one end of said casing and maintaining said flexible shaft in operable alignment with said coupling shaft and handpiece, the improvement therewith comprising

ball bearing members disposed within said handpiece for operably axially rotatably mounting said coupling shaft, said ball bearing members comprising a ball bearing member at an input end of said coupling device and another ball bearing member at an output end of said coupling device,

a washer disposed between said ferrule and said input end bearing member,

an annular recess disposed at an input end of said handpiece, and

retaining means engaged within said recess for retaining at least a portion of said ferrule within said handpiece whereby

said handpiece and said retaining means will rotate together on a longitudinal axis about said portion of said ferrule within said handpiece in a direction to relieve twisting stresses introduced into said casing when said operator moves said worktool by said handpiece with respect to a workpiece.

4,185,475

UNIVERSAL JOINT ASSEMBLY

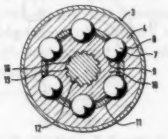
Hans-Joachim Kleinschmidt, and Gerd Faulbecker, both of Essen, Fed. Rep. of Germany, assignors to Gelenkwellenbau GmbH, Essen, Fed. Rep. of Germany

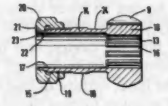
Filed Apr. 4, 1978, Ser. No. 893,526

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715616

Int. Cl.[2] F16D *3/30*

U.S. Cl. 64—21 **2 Claims**





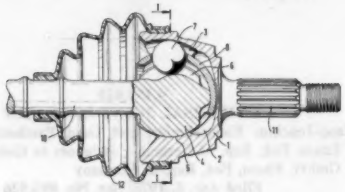
1. A universal joint assembly comprising: an inner joint member; an outer joint member; said inner joint member and said outer joint member being arranged to be slideably movable relative to each other in the axial direction of said joint assembly; torque transmitting elements interposed between said inner and outer joint members; grooves arranged in both said inner and outer joint members for holding in operative position therein said torque transmitting elements; cage means for supporting said torque transmitting elements in operative position within said grooves; a drive shaft; splined means interposed between said inner joint member and said drive shaft connecting said inner joint member with said drive shaft in rotatably fixed engagement while permitting axial movement therebetween; a hollow extension member formed on said inner joint member on the side thereof outwardly of said joint assembly, said extension member having an internal diameter portion substantially equivalent to the outside diameter of said drive shaft, said internal diameter portion being arranged on said inner member on the side of said splined means axially outwardly of said joint assembly; an axially slotted bevelled end portion formed on said extension member; a cylindrical outer circumferential wall on said extension member having screw threads formed thereon; and nut means adapted to be threadedly engaged about said cylindrical outer circumferential wall, said nut means including an internally bevelled wall adapted to engage with said axially slotted bevelled end portion of said extension member to clamp said drive shaft with said internal diameter portion of said inner joint member by tightening of said nut means about said extension member.

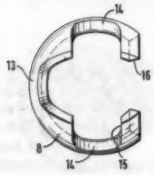
4,185,476

CONSTANT VELOCITY UNIVERSAL JOINT

Werner Krude, Neunkirchen, Fed. Rep. of Germany, assignor to Uni-Cardan Aktiengesellschaft, Lohmar, Fed. Rep. of Germany

Filed Apr. 10, 1978, Ser. No. 895,053
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1977, 2717936
Int. Cl.[2] F16D 3/30
U.S. Cl. 64—21 8 Claims





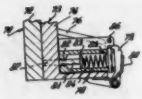
1. A constant velocity universal joint comprising a hollow outer joint member having an outer surface and an inner surface defining a cavity with an opening extending through said outer joint member into the cavity, said outer joint member having an axis extending centrally through said cavity and the opening thereinto, the inner surface of said outer joint member having a plurality of grooves formed therein and spaced angularly apart around the axis of said outer joint member, an inner joint member positioned within the cavity in said outer joint member and having an outer surface facing toward the inner surface of said outer joint member, said inner joint member having an axis extending through the opening in said outer joint member and being coaxially alignable with the axis of said outer joint member, the outer surface of said inner joint member having a plurality of grooves therein corresponding in number to the grooves formed in the inner surface of said outer joint member and said grooves spaced angularly apart about the axis of said inner joint member and each of said grooves arranged to be disposed opposite to one of said grooves in said outer joint member, a plurality of torque-transmitting balls each located in one groove in said inner joint member and in the juxtaposed groove in said outer joint member, a one-piece cage located between said inner and outer joint members within the cavity in said outer joint member, said cage having a cage window therein for each of said balls and each said cage window having oppositely disposed surfaces providing a guide for said balls, the center of said balls are directed by the disposition of the cooperating said grooves into a plane which bisects the angle included by the axis of said inner and outer joint members, wherein the improvement comprises that said cage has at least one cut-out opening therethrough extending in the axial direction of said inner and outer joint members, said cage having an open front end side extending transversely of the axis of said inner and outer joint members, said cut-out opening extending from the front end side in the axial direction of said inner and outer joint members at least to beyond the transverse plane containing the surfaces of said cage windows which guide said balls and are more remote from said front end side.

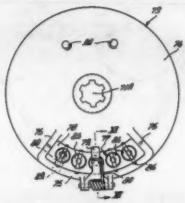
4,185,477

OVERLOAD COUPLINGS

Ary van der Lely, Maasland, and Arie Kuipers, Brielle, both of Netherlands, assignors to C. van der Lely N. V., Maasland, Netherlands

Filed Oct. 31, 1977, Ser. No. 846,972
Claims priority, application Netherlands, Nov. 1, 1976, 7612079
Int. Cl.[2] F16D 3/56, 7/00
U.S. Cl. 64—28 R 48 Claims





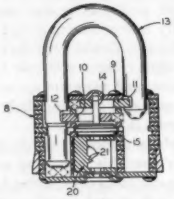
1. An overload coupling comprising two coupling members rotatable about a common axis, a first of said members having displaceable frangible means and the second member having abutment means, said frangible means normally engaging said abutment means to establish rotational movement of said members together in at least one direction of rotation, said frangible means being fracturable upon overload whereby one of said members is rotatable relative to the other member, advancement means cooperating with said frangible means and automatically urging the latter into re-engagement with said abutment means to re-establish normal rotational movement of both coupling members in common, said second coupling member comprising release means for releasing a fractured fragment of said frangible means from the abutment means, said release means comprising a channel that extends from said abutment means to the exterior of said coupling.

4,185,478

PADLOCK BODY WITH PICK RESISTANT WARDED INSERT ASSEMBLAGE

Earl G. Stintzi, Menomonee Falls, Wis., assignor to Master Lock Company, Milwaukee, Wis.

Filed Jul. 17, 1978, Ser. No. 924,963
Int. Cl.[2] E05B 67/22
U.S. Cl. 70—38 A 3 Claims



1. In combination, a padlock body including a warded insert housed within a portion of the bidy and accessible through a body wall opening for insertion of a key, a plug extension blade within the padlock body and having a key tip receiver adjacent

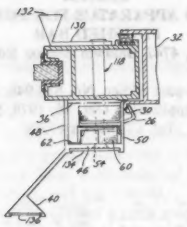
the inner end portion of the warded insert and accessible through a key-tip opening in the latter, the key tip receiver being eccentrically formed and including circularly arranged recesses which contain depending nodules and a web, and a key insertable into said warded insert and having cuts and nodules along an edge of its shank matching those in a portion of the warded insert, the tip of the key being eccentrically formed to coact with the eccentric formation of the tip receiver of the extension blade whereby turning movement of the key, when the key tip is within the key tip receiver and is in engagement with said web, effects turning movement of the plug extension blade for padlock operating purposes.

4,185,479

LOCKING HANDLE FOR SLIDING DOORS AND THE LIKE

Harry M. Riegelman, Fullerton, Calif., assignor to Rusco Industries, Inc., Fullerton, Calif.

Filed Apr. 25, 1978, Ser. No. 899,793
Int. Cl.[2] E05B *65/08*
U.S. Cl. 70—95 **10 Claims**



1. In combination:
an elongated housing having an opening in one wall;
an elongated bar movable longitudinally in said housing;
spring means in said housing;
and an elongated latch plate in said housing disposed between said bar and spring means,
said latch plate having spaced portions engageable with the inner surface of said one wall,
said latch plate being movable transversely of said bar between the first and second positions,
said spring means biasing said latch plate toward said first position in a first position of said bar,
said bar in a second position forcing said latch plate to its second position,
said latch plate having a latch portion extending through said opening and movable from one side of said opening in the first position of said latch plate to the other side of said opening in the second position of said latch plate, and the ends of said latch portion being engageable with the ends of said opening as said bar is moved between its first and second positions.

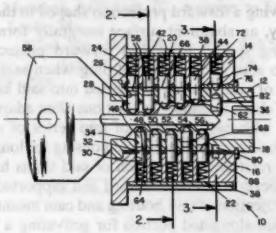
4,185,480

KEY-OPERATED PIN TUMBLER LOCK

Julius Pechner, 16010 Blackhawk St., Granada Hills, Calif. 91344

Filed Mar. 30, 1978, Ser. No. 891,609
Int. Cl.[2] E05B *25/00*
U.S. Cl. 70—358 **30 Claims**

1. In a key-operated pin tumbler lock having a housing, a plug movable therein, means including at least two shear lines between said housing and said plug, means including elements disposed in columns in at least two rows respectively positioned along said shear line means in a unique lock combination and selectively movable in said housing and said plug into blocking and unblocking positions therebetween respectively for coupling said plug to said housing to prevent relative movement therebetween and for uncoupling said plug from said housing to permit relative movement therebetween, an operating key insertable in said plug and having means respectively contactable with said elements along each of said shear line means for selectively moving said elements from their blocking positions and into their unblocking positions in accordance with the unique combination, and means in and between said housing and said plug for changing the unique lock combination to another lock combination, the improvement in which:



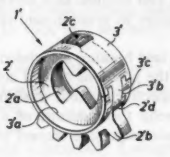
said columns of said elements of a first of said rows are axially alternating from said columns of said elements of a second of said rows, to prevent miscoupling respectively of said contactable means of said key with said first row elements and with said second row elements when said key is fully inserted in said plug.

4,185,481

LOCK FOLLOWER, PARTICULARLY A CYLINDER FOLLOWER, AND A METHOD OF MANUFACTURING THE SAME

Erik R. Tranberg, Eskilstuna, and Bo G. Widen, Torshalla, both of Sweden, assignors to Gkn-Stenman AB, Eskilstuna, Sweden

Filed Mar. 7, 1978, Ser. No. 884,445
Claims priority, application Sweden, Mar. 8, 1977, 7702602
Int. Cl.[2] E05B *17/04*
U.S. Cl. 70—379 R **5 Claims**



1. A lock follower comprising two main parts which are attached to each other, characterised in that one main part comprises a central part which is punched or clipped from a sheet-material blank, the other main part comprising a cylindrical bearing part joined to said central part, said bearing part partially surrounding the central part and having a slot through which a portion of the central part projects.

4,185,482

LOCK DECODING MECHANISM

William B. Nail, 247 Terrace Park, Rochester, N.Y. 14619

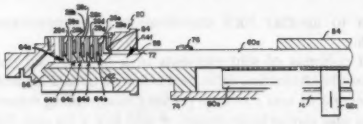
Filed Feb. 23, 1978, Ser. No. 880,657
Int. Cl.[2] E05B *19/20*; G01B *5/20*
U.S. Cl. 70—394 **3 Claims**

1. Mechanism for opening and/or decoding the biddings of a key for opening a cylinder lock, said lock being of the type having a shell, a cylindrical plug mounted in said shell for relative rotation thereto, said cylindrical plug defining a key-

way, a series of movable tumblers supported in said cylindrical plug and disposed in intersecting relationship with said keyway, said tumblers being urged toward respective first positions for preventing relative rotation of said cylindrical plug and said shell, said tumblers being movable to respective second positions by the biddings of the key when inserted in said keyway thereby enabling said cylindrical plug to be rotated relative to said shell by said key, said mechanism comprising:

a housing having a forward projection shaped in the form of a key body, an abutment surface integrally formed with said housing spaced from said forward projection and disposed to abut said cylindrical plug when said forward projection of said housing is inserted into said keyway;

a plurality of shims including at least one shim adapted to be associated with each tumbler of said series of tumblers, said shims being supported in said housing for longitudinal movement relative thereto, each of said shims having an elongated portion directed toward and supported on said forward projection of said housing and cam means extending from said elongated portion for activating a tumbler, said cam means being in the shape of a tooth of a height



greater than the maximum movement of any of the tumblers from its first to its second position, said tooth having one face extending perpendicularly from said elongated portion to said height and a second oppositely directed inclined face, said tooth being located along said elongated portion at a distance from the lead end thereof so as to position said inclined face in contact with a respective tumbler when said forward projection is inserted into said keyway to a depth at which said abutment surface abuts against said plug;

a plurality of actuators extending transversely from said plurallity of shims respectively, each actuator being longitudinally selectively shiftable for moving its respective shim such that said inclined face moves with respect to its associated tumbler to position said tumbler in its second position; and

indicia means on said housing associated with said actuators for indicating the positions of said actuators corresponding to the respective second positions of each of said tumblers whereby the biddings of a key to move said tumblers to their respective second positions may be determined.

4,185,483

DOOR LOCKING DEVICE

Stephanie Lupton, and Mary Lupton, both of 505 N. Lake Shore, Chicago, Ill. 60611

Filed Apr. 12, 1978, Ser. No. 895,621
Int. Cl.² E05B *13/00*
U.S. Cl. 70—416 **3 Claims**

1. A protable locking device for a door comprising, in combination,

a key-operated lock for said door;

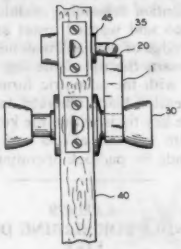
said lock including tumblers therein which are adapted to be rotated by said key;

key latch means connected to said tumblers and adapted to turn with said tumblers as said tumblers are rotated by said key;

said door including opening means operated by a handle having a stem extending from said door;

said stem located in relative close proximity to said key latch;

wedge means inserted between and in abutment with said stem and said key latch means, whereby said key latch



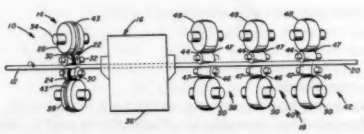
cannot be rotated when said wedge means is inserted between said stem and said key latch.

4,185,484

PROCESS AND APPARATUS FOR FORMING COLD FINISHED BAR

Finn B. Abramsen, 4742 Baldwin Manor Rd., Pittsburgh, Pa. 15227

Continuation-in-part of Ser. No. 810,948, Jun. 29, 1977, abandoned. This application Oct. 16, 1978, Ser. No. 951,599
Int. Cl.² B21B *45/04*
U.S. Cl. 72—40 **10 Claims**



1. Apparatus for forming cold finished bar from hot rolled round comprising,

a primary scale remover for receiving the hot rolled round,

said primary scale remover including a cross-rolling unit having a first rotating means for frictionally engaging the surface of the round and a second rotating means for supporting said first rotating means to exert sufficient pressure on the round to deform the round and thereby remove a substantial portion of the scale from the surface of the round,

said first rotating means including a pair of work rolls each having a concave surface,

a rugulose surface extending in an annular ring around said each work roll on said concave surface intermediate said work roll,

said rugulose surface being formed by a rough abrading surface free of sharp edges and thereby adapted to frictionally engage the round,

said rugulose surface being operable to apply maximum rolling pressure to dislodge the scale from the round and to impart rotary motion to the round so that the round rotates along a spiral path as the round advances linearly through said primary scale remover,

said second rotating means including a pair of backing rolls each having a convex surface positioned in abutting relation with said concave surface of said respective work roll,

said backing rolls each having a relief portion positioned oppositely of said respective rugulose surface,

said relief portion being recessed a preselected depth from said backing roll convex surface and extending around said backing roll to form a surface having a width greater than the width of said rugulose surface, and

a pair of sidewalls extending upwardly from said recessed

surface to said convex surface to thereby remove said backing roll convex surface from contact with said rugulose surface and maintain contact of said backing roll convex surface with said work roll concave surface.

4,185,485

LUBRICANT COMPOSITIONS FOR CAN FORMING

John W. Schick, Cherry Hill; Robert H. Davis, Pitman, and Harry J. Andress, Wenonah, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 30, 1978, Ser. No. 921,019

Int. Cl.[2] C07C *69/40;* **C10M** *3/04, 3/18, 3/26*

U.S. Cl. 72—42 **23 Claims**

1. An emulsifiable composition comprising:

(a) an ester formed by reacting an alkenylsuccinic anhydride or acid, wherein the alkenyl is derived from a mixture of C_{16}–C_{28} olefins, with

(1) a hydroxy-containing tertiary alkylamine containing 2 to 100 carbon atoms or

(2) a hydroxypolyetheramine of the formula

$$R-N(R')-(CH_2CH_2O)_xCH_2CH_2OH \quad \text{or}$$

$$R-N(R')-(CH_2CH_2CH_2O)_xCH_2CH_2CH_2OH$$

wherein R is a C_8 to C_{18} hydrocarbyl group, R′ is selected from the group consisting of R and a polyether group derived from 1–50 moles of ethylene oxide or propylene oxide, and x is 1 to 50,

(b) the product of (a) (2) and a rosin soap, or

(c) the product of (a) or (b) and from about 0.5% to about 15.0% by weight of a C_2–C_{10} monocarboxylic acid, the reaction to form said ester being carried out at from about 100° C. to about 300° C.

4,185,486

ROTATABLE PIERCING TOOLS FOR FORMING BOSSED HOLES

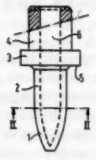
Johannes A. van Geffen, Apeldoorn, Netherlands, assignor to Technisch Handels- en Adviesbureau van Geffen B.V., Apeldoorn, Netherlands

Filed Nov. 17, 1978, Ser. No. 961,707

Claims priority, application Netherlands, Nov. 17, 1977, 7712700

Int. Cl.[2] B21D *28/36*

U.S. Cl. 72—71 **5 Claims**



1. A rapidly rotatable piercing tool for forming, substantially by frictional heat and pressure, a hole surrounded by a boss in a metal plate or the wall of a metal tube, said tool having a tapered first portion, a second portion adjoining said first portion coaxially and having a shape, which is adapted to the shape of the hole to be formed, a third portion adjoining the second portion coaxially and a shank adjoining the third portion coaxially and meant for the attachment of the piercing tool in a machine tool, the piercing tool having in addition a coaxial cavity which extends from the free end of the shank to a place at a given distance from the leading end of the first portion and has such a shape as to ensure that the wall surrounding said cavity has in all places at least a predetermined thickness.

4,185,487

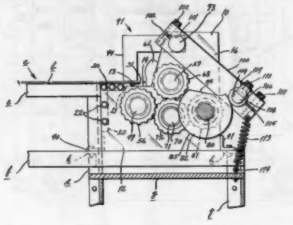
SIDE ACCESS CLEAT FORMER APPARATUS AND METHOD OF USE

Dallas L. Merideth, Millstadt, Ill., assignor to Engel Industries, Inc, St. Louis, Mo.

Filed May 30, 1978, Ser. No. 910,523

Int. Cl.[2] B21D *5/04, 37/08*

U.S. Cl. 72—315 **2 Claims**



1. Side access apparatus for forming cleat edges on sheet metal workpieces, being of the type comprising

a work table by which a working level is established,

a forming blade having a straight rear edge supported at said working level by a pair of side plates,

aligned bushing means in said side plates at a level below the edge of said blade and a lower rotatable wiper supported therein,

second aligned bushing means supported by said side plates at substantially the level of said forming blade and an aft rotatable wiper supported thereon,

aligned bearing means supported by said side plates at a substantially higher level than said forming blade and a rocker-arm type clamp shaft assembly supported therein, said assembly having clamp portions extending forwardly and down, whereby to permit clamping of a sheet metal workpiece relative to said forming blade, and having a tilt lever whereby to rock said assembly to a clamped position, and

gear train means connecting a power source to the said rotatable wipers, whereby to rotate them in the same sense at the same speed,

characterized in that

each said side plate is generally L-shaped and comprises a side plate lower portion having means at its upper edge to support an end of said blade, said lower portion having in its upper edge a cutout in sideward registration with the rear edge of said forming blade, and an aft portion continuing from said lower portion and extending upward thereof spacedly beyond the said forming blade, further characterized in that

at least one of said side plates has a shaft aft of said rocker-arm bearing means engaged to said drive train and mounting a generally circular center-mounted cam having a removed generally segment shaped portion, and in that

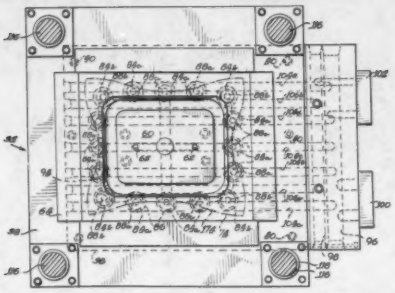
said tilt lever extends generally rearward and downward and has a cam follower operatively bearing against the aft side of said cam outer surface, and further has a return spring,

whereby bearing of the cam follower against the circular outer surface portion of the cam rocks the clamp shaft assembly for clamping, and its bearing against the removed segment shaped portion releases such clamping, thereby permitting side access through the side plate cutouts for inserting and removing such workpieces.

4,185,488
METHOD FOR FORMING A CONTAINER PAN

Roland E. Miller, Orangeville; Joseph A. Scaletta, Mount Prospect, and John Valek, Cicero, all of Ill., assignors to Kraft, Inc., Glenview, Ill.

Filed Jul. 22, 1976, Ser. No. 707,821
Int. Cl.[2] B21D *22/00*
U.S. Cl. 72—350 8 Claims

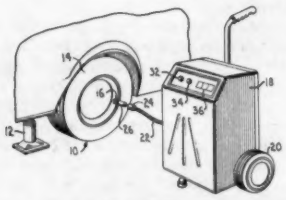


1. A method for forming a rectangular container pan having a bottom surface and upstanding side walls interconnected through smooth radially curved corner walls, said method comprising the steps of; clamping the full peripheral surface of a blank from which the rectangular pan is to be formed between opposed fluid pressure operated clamping members, effecting engagement of the opposite surfaces of said blank with forming die means to draw the clamped blank between said clamping members while simultaneously forming the bottom, side walls and corner walls of the rectangular pan, applying a clamping force to the clamping members simultaneously with said forming of said bottom, side walls and corner walls, said clamping force applied to said blank at the portions thereof which form said side walls being substantially constant throughout forming of said bottom, side walls and corner walls, and said clamping force applied to said blank at the portions thereof which form said corner walls being substantially constant throughout forming of said corner walls but less than the clamping force applied to the portions of said blank which form said side walls.

4,185,489
SPEEDOMETER TESTER

Maurice D. Sullivan, Jr., Overland Park, Kans., assignor to Thomas E. Sullivan, Kansas City and III James W. Kirkpatrick, Lenexa, both of, Kans., part interest to each

Continuation-in-part of Ser. No. 822,723, Aug. 8, 1977, abandoned. This application Sep. 5, 1978, Ser. No. 939,494
Int. Cl.[2] G01P *21/02*
U.S. Cl. 73—2 16 Claims



9. A method of testing the speedometer of a stationary vehicle having a driven wheel from which a treaded projection extends, said method comprising the steps of:

raising said driven wheel to an elevation where a tire thereon is out of engagement with the road surface,

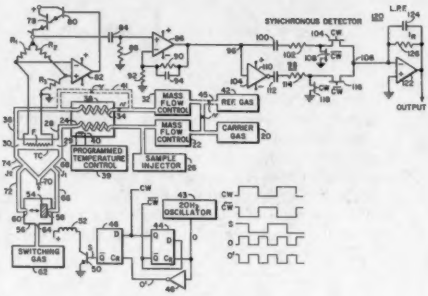
removably securing a component to said projection having a characteristic that enables the component to be sensed as the wheel rotates and the component passes in proximal relationship to a sensor therefor; driving said wheel, producing a train of electrical pulses having a repetition rate proportional to the speed of rotation of the wheel, in response to said sensor positioned adjacent the path of travel of said component, and

processing said pulse train to determine the speed of the vehicle corresponding to the rotative speed of the wheel.

4,185,490
PHASE DISCRIMINATION IN MODULATED THERMAL CONDUCTIVITY DETECTOR

David E. Clouser, Claymont, Del., and John S. Craven, West Grove, Pa., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 6, 1978, Ser. No. 949,312
Int. Cl.[2] G01N *31/08*
U.S. Cl. 73—23.1 4 Claims



1. In a gas chromatograph,

a chromatographic column,

a source of reference gas,

a thermal conductivity detector,

means for alternately switching said thermal conductivity detector between the output of said column and the output of said source of reference gas at a given switching frequency so as to produce an output signal that may have a flow component in phase with said switching frequency, the flow rates of said sample gas and reference gas being such as to produce a thermal conductivity component in said output signal that is not in phase with the switching frequency,

means providing a control signal having said switching frequency,

a synchronous detector,

means coupling said output signal of said thermal conductivity detector to said synchronous detector, and

means coupling said control signal to said synchronous detector in such manner that it is in or near phase quadrature with the flow component of the output signal.

4,185,491
GAS MONITORS

Leslie J. Owen, Porthcawl, Wales, assignor to British Steel Corporation, England

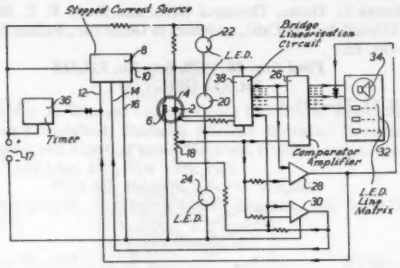
Filed Dec. 12, 1977, Ser. No. 859,522
Claims priority, application United Kingdom, Jan. 10, 1977, 779/77
Int. Cl.[2] G01N *27/14*
U.S. Cl. 73—27 R 10 Claims

1. In a gas monitoring device having a gas sensor of the semi-conductor type, a heating device located adjacent to said

gas sensor such that increasing or decreasing the temperature of the heating device increases or decreases the temperature of the gas sensor, and a power source for energizing the sensor and the heating device, the improvements comprising:

(a) first comparing means to compare an output from said sensor to a first gas concentration threshold value and provide a first output signal when said sensor output exceeds said first threshold value;

(b) second comparing means to compare the sensor output to a second gas concentration threshold value and provide a second output signal when said sensor output exceeds said second threshold value; and,



(c) stepped current source means connected to said power source, said heating device, and said first and second comparing means so as to maintain said heating device and, consequently, said sensor at a quiescent temperature under normal operating conditions and wherein said stepped current source reduces the power supplied to the heating device to thereby lower its temperature and the temperature of said sensor upon receipt of a signal from said first comparing means and increases the power supplied to the heating device to thereby raise its temperature and the temperature of the sensor upon receipt of a signal from said second comparing means.

4,185,492

LEAK TESTING APPARATUS AND IMPROVED SEALS THEREFOR

Thomas D. Hauk, 5313 Mezzanine Way, Long Beach, Calif. 90808, and Ernest D. Hauk, 57430 Aviation Dr., Yucca Valley, Calif. 92284

Filed Oct. 10, 1978, Ser. No. 950,026
Int. Cl.[2] G01M *3/28*; F17D *5/02*
U.S. Cl. 73—46 **28 Claims**

1. Apparatus for detecting leaks in joints in pipe sections, which comprises:

casing means adapted to open for lateral reception of a jointed pipe section, and then to close to define a chamber around at least one joint in said pipe section,

means to lock said casing means in closed condition,

means to seal said chamber without the necessity of employing a packer therein,

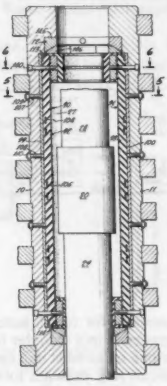
said seal means including a longitudinal strip seal for sealing a longitudinal joint between opposed regions of said casing means when the latter is in closed condition,

said strip seal having a rubber body adapted to be deformed in response to closing of said casing means, and to be further deformed in response to creation of high fluid pressures within said chamber,

said rubber body of said longitudinal strip seal having molded at an outer surface thereof substantially non-deformable insert means adapted to cooperate with said longitudinal strip seal in sealing very high fluid pressures in said chamber, said insert means bridging said longitudinal joint and adapted to be pressed against said casing means to prevent extrusion of said strip seal through said longitudinal joint,

said seal means further including end seal means provided around said pipe section at the ends of said chamber to prevent escape of high-pressure fluid longitudinally of said pipe section,

means to create a very high fluid pressure in said sealed chamber, and



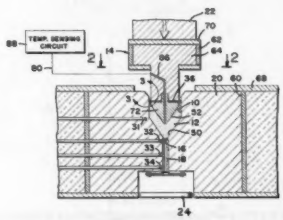
means to indicate a reduction in the fluid pressure in said chamber, thus indicating the presence of a leak in a joint in said pipe section.

4,185,493

VISCOSITY MEASURING INSTRUMENT

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Samuel P. Feinstein, Sunland, Calif.

Filed Jun. 23, 1978, Ser. No. 918,535
Int. Cl.[2] G01N *11/06, 11/08*
U.S. Cl. 73—56 **10 Claims**



1. Apparatus for measuring the viscosity of a material, comprising:

walls forming a sample holding cylinder with an exit opening; and

a piston movable in said cylinder to compress a sample therein so it flows out through the exit opening;

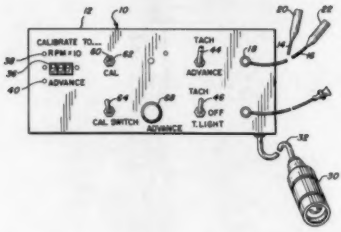
said piston including a body of smaller diameter than the cylinder and a seal extending between said body and cylinder walls, said seal consisting of a sheet of compressed carbon.

4,185,494

DIAGNOSTIC SYSTEM FOR FUEL INJECTED ENGINES

Edward Yelke, LaGrange, Ill., assignor to Creative Tool Company, Lyons, Ill.

Filed Jun. 8, 1978, Ser. No. 913,826
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—119 A 11 Claims



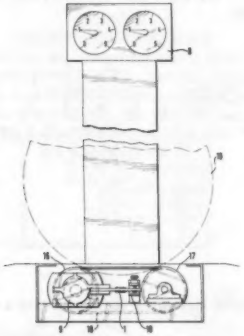
10. A transducer assembly for fuel injected engines of the type wherein fuel is conveyed to a cylinder through a conduit which is terminated at one of its ends in a circular banjo-type line fitting having fuel-carrying passages located therein, said assembly comprising a bolt-like transducer housing having a hollowed shank portion for transferring fuel from said fuel-carrying passages of said line fitting and an expanded head portion coupled to said shank portion and extending in overlapping relation over said banjo-type fitting when said shank portion axially intersects said banjo fitting, said head portion serving to compress said banjo-type fitting in completing the fuel path from the fitting to the hollowed shank portion, and a piezoelectric slab coupled to said head portion in a plane parallel to and in close proximity to the interface between said head portion and said banjo-type fitting.

4,185,495

BRAKE TESTING APPARATUS

Winfried Rauch, 76½, and Josef Schilling, 30½, both of 8961 Haldenwang, Fed. Rep. of Germany

Filed Jul. 13, 1978, Ser. No. 924,396
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1977, 2733639
Int. Cl.[2] G01L *5/28*
U.S. Cl. 73—126 12 Claims



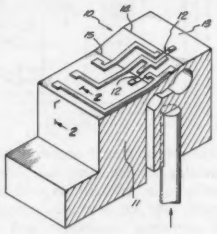
1. Motor vehicle brake testing apparatus comprising a frame, a pair of rollers mounted on said frame for supporting a wheel having a brake to be tested, a drive motor for rotating said rollers, said motor having a stator and a rotor, said stator being mounted for rotational movement relative to said stator on the influence of reverse torque induced in said stator on the application of a brake being tested, a torque arm in the form of an elongated spring having one end attached to said stator, said spring extending outwardly from said stator and terminating in a free outer end, an abutment member on said frame for reacting against a surface of said spring adjacent said free outer end on the application of reverse torque to said stator thereby establishing a stress in said spring, strain gauge means associated with said spring for sensing the stress, and indicator means associated with said strain gauge means for measuring the stress.

4,185,496

THIN FILM STRAIN GAGE AND PROCESS THEREFOR

Thomas C. Tisone, Thousand Oaks, and Barry F. T. Bolker, Oxnard, both of Calif., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Aug. 28, 1978, Ser. No. 937,413
Int. Cl.[2] G01L *1/22*
U.S. Cl. 73—141 A 4 Claims



1. In a strain gage having thin film resistors deposited on a flexure beam, the improvement comprising:

at least one dielectric film in compression when said flexure beam is unstressed, arranged between the resistors and the flexure beam; and

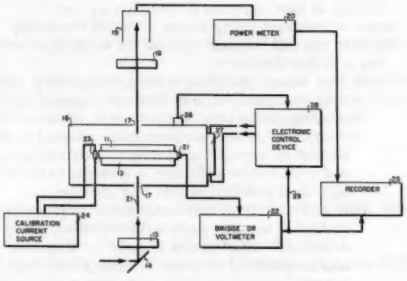
at least one dielectric film disposed over the film resistors, and compressingly stressed when said flexure beam is unstressed.

4,185,497

ADIABATIC LASER CALORIMETER

Donald L. Decker, and Paul A. Temple, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 2, 1978, Ser. No. 947,379
Int. Cl.[2] G01K *17/00*
U.S. Cl. 73—190 EW 10 Claims



1. A vacuum, adiabatic, calorimeter, comprising:

sustaining means for maintaining an adiabatic environment in said calorimeter;

support means, connected to said sustaining means, for holding a material to be tested in the path of incident electromagnetic energy;

calibration means, connected to said support means, for supplying a known quantity of energy to said material;

temperature sensing means, connected to said support means, for calculating temperature changes in said material; and

scanning means, connected to said sustaining means, for allowing said material to be moved with respect to said electromagnetic energy.

4,185,498

FLOWMETER

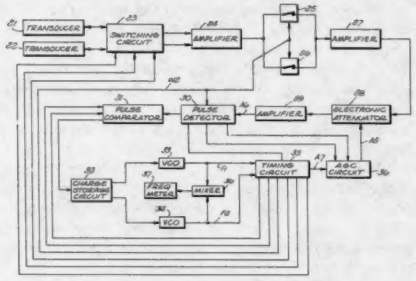
Christopher A. Watson, Upland, Calif.; Kenneth E. Bearcroft, Bishop's Stortford, England; Michael Bronzite, Brussels, Belgium, and Alan G. Palmer, Hertford, England, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jul. 20, 1978, Ser. No. 926,260

Claims priority, application United Kingdom, Jun. 3, 1977, 23787/77

Int. Cl.[2] G01F *1/66*

U.S. Cl. 73—194 A **9 Claims**



3. A flowmeter comprising: a first transducer for mounting at a first point in a pipeline; a second transducer for mounting in alignment with said first transducer, but at a second point in said pipeline spaced lengthwise from said first point; first means including first and second voltage controlled oscillators to energize respectively said first and second transducers at first and second respective times with first and second pulses to transmit vibrations through fluid in said pipeline in opposite directions, respectively; second means to receive vibrations transmitted from said first and second transducers through said fluid and subsequently through said second and first transducers, respectively; a first counter adapted to count a plurality of pulses before reset, and connected from said first voltage controlled oscillator (VCO); a second counter adapted to count a plurality of pulses before reset, and connected from said second VCO; third means connected from said second means and said first and second counters to control the frequency of said first VCO and to control the frequency of said second VCO in a manner such that a first pulse, transmitted at a first time by said first transducer, arrives at said second transducer a second time later than said first time by an integral number of counts of said first counter, and in a manner such that a third pulse, transmitted at a third time by said second transducer, arrives at said first transducer a fourth time later than said third time by an integral number of counts of said second counter; fourth means responsive to one state of said second counter to gate the output of said first VCO to said first transducer; and fifth means responsive to one state of said first counter to gate the output of said second VCO to said second transducer.

4,185,499

ARRANGEMENT FOR MONITORING AN OIL SUPPLY OF A LUBRICATION SYSTEM TO BE USED FOR HEAVY MACHINERY

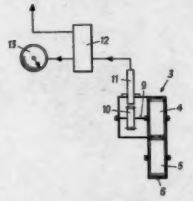
Ernst Riegler, Enns, and Manfred Schmidt, Linz, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jun. 21, 1978, Ser. No. 917,675

Claims priority, application Austria, Jun. 28, 1977, 4559/77

Int. Cl.[2] G01F *1/115*

U.S. Cl. 73—229 **2 Claims**



1. An arrangement for monitoring an oil supply of a lubrication system used for heavy machinery, in particular for a converter tilting drive, comprising

an oil supply conduit,

a liquid flow counter designed as a toothed wheel counter installed in said oil supply conduit and including two meshing, outwardly-toothed wheels, a shaft being provided on one of said two meshing outwardly-toothed wheels,

a measuring wheel mounted outside of the oil supply conduit and being mechanically connected to said shaft, thereby rotating with said shaft,

an impulse generator allocated to said measuring wheel, said impulse generator being provided for measuring the rotational speed of said measuring wheel and generating impulses in dependence on the amount of oil passing said toothed wheel counter,

an impulse receiver for receiving said impulses from said impulse generator, and

a signalling device associated with said impulse receiver for indicating when the oil supply is below a preset limit and automatically controlling the machinery in response thereto, said impulses being led to said signalling device.

4,185,500

SAMPLE INTRODUCTION SYSTEM

Hansueli Buser, Arlesheim, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 6, 1978, Ser. No. 958,454

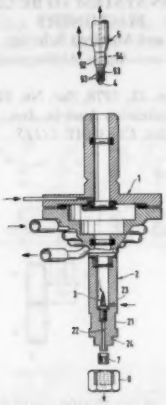
Claims priority, application Switzerland, Nov. 9, 1977, 13666/77

Int. Cl.[2] G01N *1/10, 1/22*

U.S. Cl. 73—422 GC **6 Claims**

1. A sample introduction system for a gas chromatograph, comprising a chamber provided with a receiving needle for sample capsules and a connection for a separating column, a lock upstream of the chamber, and a substantially rod-shaped sample holder, at one end of which a sample capsule can be

fixed and by means of which the capsule can be introduced into the chamber through the lock, wherein the sample holder is



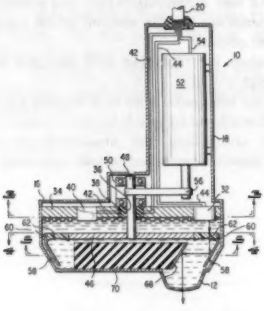
hollow and its end remote from the capsule is provided with a pressure control valve.

4,185,501

ULTRASONIC SECTOR SCANNER

Andrew P. Proudian, Chatsworth, and Arthur E. Nagy, Santa Monica, both of Calif., assignors to Second Foundation, Woodland Hills, Calif.

Filed Feb. 13, 1978, Ser. No. 876,989
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—641 **17 Claims**



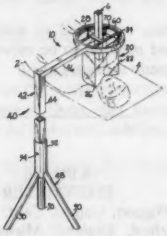
1. An ultrasonic sector scanner comprising:
a housing;
one or more movable reflector means positioned within said housing;
one or more ultrasonic transducer means mounted within said housing and positioned to direct ultrasonic waves toward the surface of said movable reflector means;
means for conducting said ultrasonic waves;
stationary reflector means mounted within said housing and positioned to receive ultrasonic waves reflected from said movable reflector means; and
support means for supporting said movable reflector means, and for causing said movable reflector means to traverse and arcuate path with respect to said stationary reflector means whereby said ultrasonic waves scan across said stationary reflector means and are reflected to converge at a point a preselected distance in front of said stationary reflector means.

4,185,502

TRANSDUCER COUPLING APPARATUS

Ralph Frank, 910 East Ave., Onalaska, Wis. 54601

Filed Oct. 11, 1977, Ser. No. 840,583
Int. Cl.[2] G01N *29/00*; A01B *5/00*
U.S. Cl. 73—644 **7 Claims**



1. Apparatus for operatively coupling an ultrasonic energy source to a target object, which comprises:
(a) a support member suitable for positioning adjacent to the target object;
(b) a container for holding an energy transmitting liquid, the container including a closed bottom portion having a noncircular cross-sectional configuration for contacting the target object, and a top portion through which the ultrasonic energy source extends for immersion in the energy transmitting liquid held in the container, the top portion being so configured such that the ultrasonic energy source is substantially unobstructed for movement relative to the container to allow a selective repositioning of the ultrasonic energy source therein; wherein the top portion of the container is completely open allowing the ultrasonic energy source to be inserted into the energy transmitting liquid without touching any portion of the container, and in which the container comprises:
(i) a polygonal shaped support frame having a plurality of sides which surround and define an open central area;
(ii) a flexible bag having a first open end and a second closed end; and
(iii) means for attaching the flexible bag in an opened orientation to the support frame such that the open end of the bag communicates with the open central area of the support frame to define the open top portion of the container; and
(c) support means for pivotably mounting the container on the support member for selective rotation relative thereto about a substantially vertical axis such that the bottom portion of the container is able to contact different areas of the target object, whereby the area of the target object being affected by the output of the ultrasonic energy source may be selectively varied by selectively rotating the container and by selectively repositioning the ultrasonic energy source inside the container, in which the support means for mounting the container comprises:
(i) a substantially circular ring attached to the support member, the ring having an inner diameter and a substantially horizontal support surface positioned adjacent to and inwardly of the inner diameter; and
(ii) at least two of the sides of the support frame being spaced apart in an opposed relationship, the two opposed sides being spaced apart a sufficient distance such that the container is rotatably supported on the ring by a resting engagement of the two opposed sides of the support frame on the horizontal support surface of the ring.

4,185,503

VIBRATION DETECTOR

Makoto Saito, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

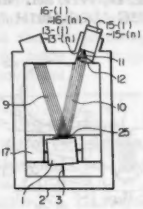
Filed May 5, 1978, Ser. No. 903,063

Claims priority, application Japan, May 9, 1977, 52-52127

The portion of the term of this patent subsequent to May 8, 1996, has been disclaimed.

Int. Cl.[2] G01N *29/00*

U.S. Cl. 73—653 **5 Claims**



1. A vibration detector comprising a stationary housing, a mass pivotally mounted in the housing so that it can deflect in an oscillatory manner from a vertical datum position upon the application of vibration to the housing, and returns to the datum position after cessation of the application of vibration, an optical mirror fixed horizontally on the top of the mass, a light source mounted on the stationary housing, a light beam receiving plane optically connected to a plurality of cells mounted on the stationary housing, a first optical means for directing the light beam from the light source onto the mirror, a second optical means for focusing the light beam reflected by the mirror from the light source on to said light beam receiving plane and each of said cells being arranged to provide an electrical signal according to the cell that the light beam illuminates depending upon the deflection of the mass.

4,185,504

APPARATUS FOR MEASURING THE PRE-TENSION OF A THREADED BOLT

Gerhard Exner; Volfango Festinori, and Detlef Luckschus, all of Berlin, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Oct. 26, 1978, Ser. No. 954,848

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1977, 2749536

Int. Cl.[2] G01L *5/24*

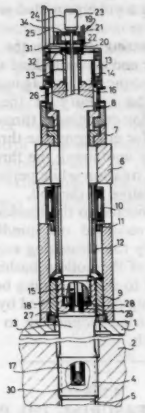
U.S. Cl. 73—761 **5 Claims**

1. In an apparatus for measuring the pre-tension of a threaded bolt useful with a portable tensioning device for closing a reactor pressure vessel and having a measuring rod for insertion through the tensioning device and any associated tensioning bolt to the lowest point of a central, closed hole in the threaded bolt and a measuring device for determining the difference in length between the threaded bolt and the measuring rod, the improvement comprising:

a two-part measuring rod having an upper threaded rod part and a lower tube threadedly engaged with the upper part and secured against rotation,

a guide rail connected to the tensioning device and supporting a mounting for motion in the longitudinal direction of the threaded rod,

a motor having a housing and a braking device carried on the mounting, the motor being connected to the measuring rod for turning it, and



a length measuring device fastened on the mounting and having a part resting on an end face of an extension part directly or indirectly connected to the threaded bolt.

4,185,505

APPARATUS FOR MEASURING THE PRE-TENSION OF A THREADED BOLT

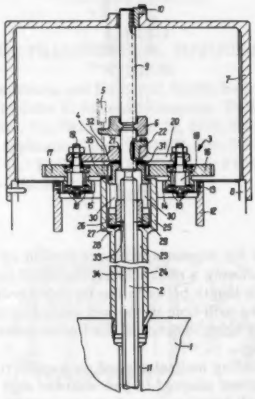
Gerhard Exner; Volfango Festinori, and Detlef Luckschus, all of Berlin, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim, Fed. Rep. of Germany

Filed Oct. 26, 1978, Ser. No. 954,849

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1977, 2749537

Int. Cl.[2] G01L *5/24*

U.S. Cl. 73—761 **8 Claims**



1. In an apparatus for measuring the pre-tension of a threaded bolt useful for closing a reactor pressure vessel comprising a demountable automatic tensioning unit having a tensioning bolt for screwing into a threaded bolt and elongating it, there being a central hole in the tensioning bolt and in the threaded bolt for receiving a measuring rod and a measuring device for determining the difference in length between the

threaded bolt plus the tensioning bolt and the measuring rod, the improvement comprising:

a tensioning unit housing adapted to engage the tensioning bolt and including a yoke provided with an opening having a fitted key,

a measuring rod passing through the yoke opening and having at its upper end a longitudinal slot for receiving the fitted key and securing the rod against rotation, and further having in the vicinity of the tensioning unit a threaded portion for engaging a threaded bushing,

a threaded bushing for engaging the threaded rod,

a hollow bushing for containing the threading bushing and securing it against rotation while permitting limited longitudinal motion relative to the rod,

internal gearing connected to the tensioning bolt,

intermediate gears mounted on spindles carried, secure against rotation, by the measuring rod for meshing with the external teeth of the hollow bushing and the internal gearing connected to the tensioning bolt,

and a length measuring device carried by the measuring rod and resting on a surface connected to the tensioning bolt or the threaded bolt.

4,185,506

APPARATUS FOR MEASURING THE PRE-TENSION OF A THREADED BOLT

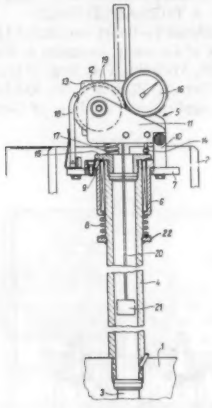
Gerhard Exner; Volfango Festinori, and Detlef Luckschus, all of Berlin, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Oct. 26, 1978, Ser. No. 954,850

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1977, 2749538

Int. Cl.[2] G01L *5/24*

U.S. Cl. 73—761 **7 Claims**



1. Apparatus for measuring the pre-tension of a threaded bolt useful for closing a reactor pressure vessel by measuring the difference in length between the threaded bolt and a part introduced into a drill hole in the bolt extending to its closed bottom, the part being fastened at the lowest point in the drill hole, comprising:

an electric holding magnet carried on a cable running off a cable drum and adapted to pass into the drill hole of the threaded bolt being measured, the magnet being capable, when energized, of sticking to the lowest point in the hole,

a tube connected directly or indirectly to the threaded bolt and having an upper flange and a spring surrounding the tube, and

a movable support for the cable drum carried on the tube and urged by the spring against the upper flange when the cable is loose, the movable support carrying a ratchet for engaging the cable drum and maintaining the length of cable constant and under tension when the magnet is in its end position, and carrying a length measuring device having an end resting on a surface of the tube.

4,185,507

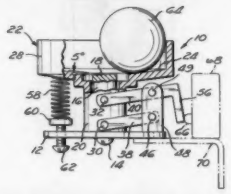
ACCELERATION RESPONSIVE TRIPPING MECHANISM

Frank F. Domyan, Canoga Park, Calif., assignor to Koso Service Co., Ltd., Toda, Japan

Filed Dec. 14, 1977, Ser. No. 860,146

Int. Cl.[2] G05G *17/00*; H01H *35/02, 35/14*

U.S. Cl. 74—2 **14 Claims**



1. An acceleration responsive tripping mechanism comprising:

a base;

an elongated member attached to said base and having a free outer end;

a movable mass normally at rest on said free outer end of said elongated member and retained thereon by the force of gravity;

an annular means located about said free outer end and having a contactable surface surrounded by a confining means preventing movement of said movable mass beyond the periphery of said contactable surface;

means for mounting said annular means to said base substantially coaxially with said elongated member for reciprocating movement along said elongated member;

means for urging said annular means upwardly, suspending said annular means relative to said elongated member;

actuation means connected to said annular means such that upon said movable mass being moved upon said contactable surface said annular means is moved downwardly relative to said elongated member causing activation of said actuation means.

4,185,508

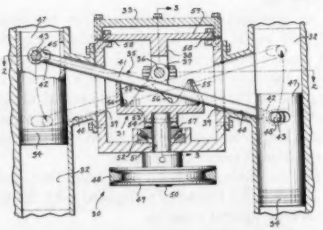
MOTION CHANGE TRANSMISSION

Peter J. Hardt, 352 N. Main St., Juneau, Wis. 53039

Filed Jun. 8, 1977, Ser. No. 804,617

Int. Cl.[2] F16H *25/08*

U.S. Cl. 74—53 **36 Claims**



1. In a motion change transmission, a framing assemblage, a rotor rotatably supported by the assemblage and having a face provided with alternating, axially and circumferentially ex-

tending hills and valleys, at least one rod disposed transversely relative to the rotor and being pivotally supported by the assemblage, said rod being operatively engageable with the face of the rotor such that when one end of the rod traverses a rotor hill the other end of the rod simultaneously traverses a rotor valley, pivot means carried by the assemblage for supporting the rod for pivoting movement relative to the rotor, said pivot means including a pivot shaft connected to said rod and projecting laterally from both sides of the rod, and said pivot means having spaced bearings connected to the framing assemblage for journalling the ends of the pivot shaft, and means for connecting at least one end of the rod to a reciprocating member, said connecting means accommodating pivotal movement of the rod and reciprocating movement of the member, and means to guide the reciprocating member in linear reciprocating movement.

4,185,509

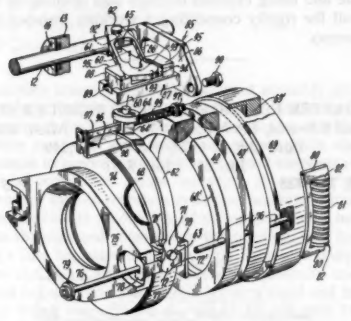
TRACTION-DRIVE TRANSMISSION

Daniel R. McLarty, Plantsville, Conn., assignor to Textron Inc., Providence, R.I.

Continuation-in-part of Ser. No. 721,938, Sep. 10, 1976, Pat. No. 4,098,146. This application Jun. 29, 1978, Ser. No. 920,332

Int. Cl.[2] F16H *15/08, 37/06*

U.S. Cl. 74—200 **12 Claims**



1. A transmission comprising a housing, a drive shaft and a driven shaft journaled for rotation in said housing on a common axis, a variable-ratio coupling mechanism coupling said shafts, said mechanism including torque-responsive reaction means having antirotational support about said axis in said housing, a control member for changing the coupling ratio between said input and output shafts, said torque-responsive reaction means including a cam pivotably carried by said housing and a follower connected to said control member and having torque-responsive displaceability with respect to said cam for modifying the instantaneous control condition of said control member, and selectively operable means for varying the effective slope orientation of said cam, whereby the rate at which the coupling ratio is varied in response to load torque is a function of the instantaneous slope orientation of said cam.

4,185,510

SPEED CHANGE DEVICE WITH DETENT MEANS

Lucien C. H. Juy, deceased, late of Dijon, France (by Henri Juy, heir), assignor to Etablissements le Simplex, Dijon, France

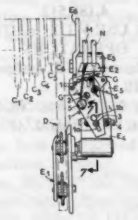
Filed Dec. 2, 1976, Ser. No. 746,786

Claims priority, application France, Dec. 2, 1975, 75 37864; Mar. 1, 1976, 76 06595

Int. Cl.[2] F16H *7/22, 11/08*

U.S. Cl. 74—217 B **18 Claims**

1. A speed-change apparatus for derailing a chain on the pinions of a free wheel cluster by cable means for each of a plurality of speeds and capable of incorporation into chain-driven bicycles and similar vehicles for use by a cyclist, said apparatus comprising an upper fixed transverse support, a lower movable transverse support, a chain guide coupled to said lower support and movable therewith to derail the chain, linkage means coupled between the upper support and the lower support for displacing said lower support transversely, control means for effecting the transverse displacement of the lower support and comprising a pivotal means constituted by a single part mounted pivotably on said upper support, said upper support having a transverse fixed position, the pivotal means having a pivotal axis and being constructed and arranged to have three functions including, firstly, a control function for the control of speed change by at least one point of attachment, on opposite sides of the pivotal axis of the pivotal means to the extremities of the cable means, the pivotal means having a lower portion connected, with latitude for



displacement, to the lower transversely movable support, secondly, a positioning function by presenting as many positioning zones as there are possible speeds, and thirdly an adjusting function for adjusting the positioning zones in relation to a pinion of the free wheel cluster, the apparatus further comprising a complementary means, each of said zones being adapted to cooperate successively with said complementary means in order to mark the position of each speed in a manner perceptible to the cyclist, said complementary means being carried by the upper support, adjusting means for adjusting the transverse position of the chain guide for positioning the chain with respect to a pinion of the freewheel cluster, and means connecting said single part with said adjusting means in coupled relation for adjusting said single part to achieve said adjusting function at said positioning zones.

4,185,511

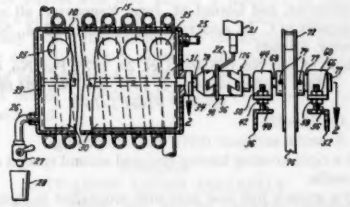
TORQUE-TRANSMITTING, TORQUE-SENSING SYSTEM

James R. Blackburn, and Dudley C. Smith, both of Dallas, Tex., assignors to John E. Mitchell Company, Dallas, Tex.

Division of Ser. No. 742,002, Nov. 15, 1976, Pat. No. 4,093,055. This application Mar. 24, 1978, Ser. No. 889,983

Int. Cl.[2] F16H *7/14;* **F16C** *35/06;* **F16D** *43/20*

U.S. Cl. 74—242.14 R **6 Claims**



1. A torque-transmitting, torque-sensing system which comprises a rotatable shaft, a bearing which helps rotatably support said shaft, a bearing block which supports said bearing and which has slot-defining portions with elongated slots therein,

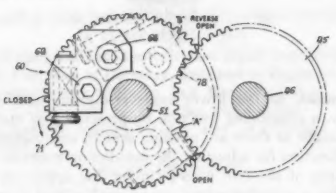
fixed studs which are threaded and which extend through said elongated slots, and nuts which are threaded onto said studs, at least two of said nuts underlying said slot-defining portions of said bearing block and at least two of said nuts overlying said slot-defining portions of said bearing block, said elongated slots permitting shifting of said bearing block in one direction transversely of the axis of said shaft, the first said two nuts disposable at different positions along the lengths of said studs of shift said bearing block transversely of said axis of said shaft in an orthogonally-displaced direction, and the second said two nuts cooperating with said first said two nuts to clamp said slot-defining portions of said bearing block against undesired shifting in either of said orthogonally-displaced directions by clamping said slot-defining portions of said bearing block against said first said two nuts.

4,185,512

DOOR STOP FOR USE WITH AUTOMATIC DOOR OPERATORS

Gerhard B. Sommer, Algonquin, Ill., assignor to Republic Industries, Inc., Chicago, Ill.

Filed May 8, 1978, Ser. No. 903,895
Int. Cl.[2] F16H *57/10*
U.S. Cl. 74—411.5 **7 Claims**



1. In an electro-mechanical, automatic door operator having a power actuated drive train embodying a plurality of rotatable gears enclosed within a housing for rotatably driving a door spindle shaft operatively connected with a door for effecting opening and closing movements thereof, the combination comprising: a pair of non-intermeshing gears of the drive train, adjacently disposed on parallel shafts and lying in parallel planes so as to partially over-lap one another, one of which gears is mounted on the door spindle shaft; and a compact stop assembly movable with said one gear and mounted thereon to lie within the circumferential confines of said one gear and in interfering alignment with the periphery of the other gear of said pair; said stop assembly being operable to abut the toothed periphery of said other gear in response to rotational movement of said one gear whereby to limit relative rotation of said pair of gears for the purpose of stopping the door at predetermined open positions.

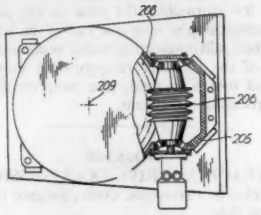
4,185,513

UNIVERSAL COUPLING

James M. Ewart, North Vancouver; Clay H. Anderson, West Vancouver, and Gerard St. Jean, Vancouver, all of Canada, assignors to C. H. Anderson and Associates Ltd., North Vancouver, Canada

Division of Ser. No. 625,460, Oct. 24, 1975, Pat. No. 4,022,430. This application Apr. 5, 1977, Ser. No. 784,681
Int. Cl.[2] F16H *1/16*
U.S. Cl. 74—425 **8 Claims**

1. A worm and gear drive unit comprising:
(a) a rigid housing having first and second spaced apart side walls;
(b) a unitary hub and gear unit journalled in said housing, said hub having a pair of spaced apart circular, relatively large bearing lands on the outer surface thereof journalled for rotation respectively on said first and second side walls;
(c) said gear comprising teeth projecting outwardly from said hub at a position between said bearing lands and being of a diameter only slightly larger than the latter;
(d) a worm journalled for rotation on said housing and meshing with said gear in drive relation;
(e) bearing faces extending outwardly from said hub respectively on opposite sides of the gear and engageable with respective ones of said walls of the housing limiting axial displacement of the hub relative thereto;



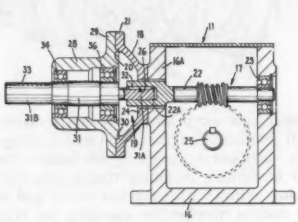
(f) an opening in one of said side walls exposing said hub therethrough; and
(g) a central web on said hub, said web extending across said hub and being exposed through said opening in the side wall for rigidly connecting a working member directly thereto.

4,185,514

ADAPTER FOR MOTOR-SPEED REDUCER SETS

E. David Edwards, 424 Mills St., Kalamazoo, Mich. 49001

Filed Oct. 2, 1978, Ser. No. 947,349
Int. Cl.[2] F16H *1/16*
U.S. Cl. 74—425 **5 Claims**



1. In combination with a C-flange worm gear speed reducer comprising a housing, an output shaft, an input shaft, a worm-worm wheel gear set for driving said output shaft from said input shaft, a C-flange attachment attached to said housing, one end of said input shaft projecting through said housing into said C-flange attachment, said one end of said input shaft being free of support by a bearing and the other end of said input shaft being supported by a bearing, said one end of said input shaft having an elongated coaxially extending recess therein, said C-flange attachment having wall means defining a cavity and a radially extending annular flange surrounding the cavity and facing in a direction away from the housing; an adapter comprising an elongated cylindrical housing having a radially extending annular flange at one end thereof which flange is affixed to the annular flange of said C-flange attachment whereby said speed reducer and said adapter are rigidly secured to each other, a drive shaft extending through said adapter housing coaxial with said input shaft of said speed reducer, said drive shaft having an inboard end portion of reduced diameter extending from said one end of said adapter housing through said cavity in said C-flange attachment and into said recess in said input shaft of said speed reducer and being drivingly connected thereto, said drive shaft having an

outboard end portion projecting from the other axial end of said adapter housing, and a pair of axially spaced-apart bearings mounted in said adapter housing close to the opposite axial ends of said adapter housing and rotatably supporting said drive shaft.

4,185,515

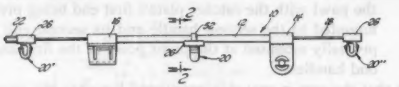
MOTION TRANSMITTING REMOTE CONTROL ASSEMBLY

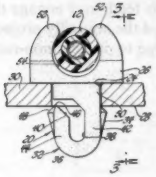
Grant A. Webb, Northville, Mich., assignor to Teleflex Incorporated, Limerick, Pa.

Filed Oct. 11, 1974, Ser. No. 514,015

Int. Cl.[2] F16C *1/10*; F16B *7/08*; B25G *3/00*; B65D *7/48*

U.S. Cl. 74—501 P **14 Claims**





1. A motion transmitting remote control assembly comprising: a guide; a flexible motion transmitting core element movably supported by said guide for transmitting motion; and connection means for connecting one of said guide and said core element to support structure and control elements respectively, said connection means including an integral snap-in connector for snap-in retention in an opening and defined by a body for disposition on one side of the opening and a head for insertion through and retention in the opening, said head including a first leg extending outwardly from said body to an outward end and a second leg extending generally inwardly from said outward end of said first leg to a distal end thereof, said legs being spaced from one another, with said first leg being relatively inflexible in a direction toward said second leg, said first leg including a shoulder facing said body and in spaced relationship thereto, said distal end of said second leg being spaced from said body substantially the same distance as said shoulder, said shoulder and said distal end each being flared upwardly and outwardly in a direction away from said body.

4,185,516

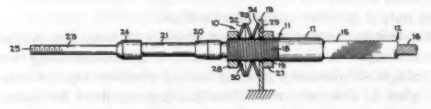
OVERLOAD SAFETY FASTENER

Glenn M. Betlinski, Cedar Rapids, Iowa, assignor to FMC Corporation, San Jose, Calif.

Filed Dec. 29, 1977, Ser. No. 865,471

Int. Cl.[2] F16C *1/10*

U.S. Cl. 74—501.5 R **4 Claims**



1. In a motion transmitting control having an outer flexible conduit bent between opposite ends, an inner operating member reciprocable within the conduit, an end fitting extending axially from one end of the conduit with an externally threaded portion adapted to fit axially through an aperture in a mounting plate, the improvement comprising an overload safety fastener for yieldably securing the end fitting within the mounting plate aperture, said fastener having a pair of stops threadedly mounted for axial movement along the externally threaded portion of the end fitting, said stops being located on opposite sides of the mounting plate, said stops having radial flange faces, one of said stops being adapted for locating the end fitting relative to the mounting plate and taking up slack in the conduit, the other stop being positioned with its radial flange face spaced axially along the end fitting from the mounting plate, and resilient means extending axially of the end fitting between the radial flange face of said other stop and the mounting plate, said resilient means being compressed to a predetermined stress to resiliently urge said other stop away from the mounting plate, said resilient means being yieldable when the predetermined stress is overcome by an opposite force from the stop, said stops and resilient means being transposable on the end fitting to opposite sides of the mounting plate for accommodating overload stresses acting from either one side or the other side relative to the mounting plate.

4,185,517

CONTROL DEVICES

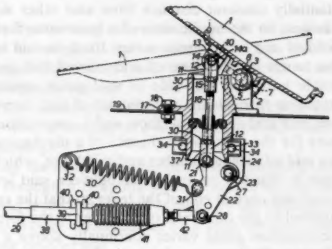
John G. Gill, Chignal St. James, Nr. Chelmsford, and James F. Hemens, Billericay, both of England, assignors to Teleflex Morse Limited, Basildon, England

Filed Jan. 21, 1977, Ser. No. 761,200

Claims priority, application United Kingdom, Jan. 23, 1976, 2681/76; Mar. 23, 1976, 11699/76

Int. Cl.[2] G05G *1/14*

U.S. Cl. 74—512 **30 Claims**



1. A pedal operated mechanism comprising a pedal, means for mounting the pedal for pivotal movement about a substantially horizontal axis (considered in one orientation of said mechanism) in a substantially vertical plane, an output means adapted for operative connection to a flexible cable element, connection means operatively connecting the output means and the pedal such that the output means will translate the cable element, when operatively connected thereto, in response to pivotal movement of the pedal, and adjusting means for swivelling the output means relative to the pedal about a substantially swivel axis into any of a plurality of angular positions in a horizontal plane such that the cable element can extend in any path complementary to the angular position in which the output means is adjusted, the connection means maintaining said operative connection between the pedal and the output means in whatever angular position the output means is adjusted.

4,185,518

ACTUATING LEVER ASSEMBLY

Hartmann Boltz, Mainz, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

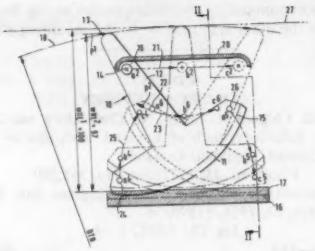
Filed Mar. 10, 1978, Ser. No. 885,318

Int. Cl.[2] G05G *1/04*

U.S. Cl. 74—516 **6 Claims**

1. An actuating lever assembly for the actuation of an adjust-

able member in a mechanical assembly, said actuating lever assembly comprising: a support frame including a support surface and a guide means having oppositely facing sides arranged substantially parallel to, and spaced apart from, said support surface, one of said sides facing toward said support surface and the other side facing away therefrom; a movable actuating lever extending across said sides of said guide means and supported in said frame, one end of said actuating lever having a symmetrically curved shape with a center of curvature located between said guide means and said support surface, said centre of curvature being located adjacent said one side of said guide means and said curved end of said actuating lever being engageable with said support surface in such a manner that said actuating lever is both supported by, and can roll relative to, said support surface, between predetermined



limits while maintaining the other end of said actuating lever at a substantially constant distance from said other side of said guide means, on the application of a transverse force to said other end of said lever; guide means fixed on said lever adjacent the centre of curvature of said curved end and slidably engageable with said one side of said guide means on said support frame to maintain engagement of said curved end of the lever and said support surface; and a connection point on said lever for the attachment thereto of a mechanical linkage between said adjustable member and said lever, which connection point is situated on said lever between said lever guide means and said curved end of the lever so that the ratio of the force applied to the other end of the lever to the force applied at the connection point varies continually above a predetermined force multiplication value as the lever is moved between said predetermined limits.

4,185,519

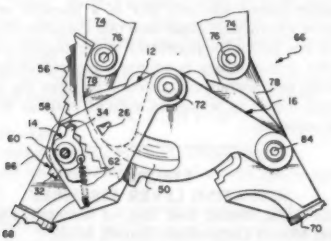
RATCHET MECHANISM FOR HAND TOOLS

Kenneth S. Hays, Exton, Pa., and Gustaf R. Lawson, Willingboro, N.J., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 30, 1978, Ser. No. 873,565

Int. Cl.[2] G05G *5/24*; B25B *7/14*

U.S. Cl. 74—577 S **1 Claim**



1. A ratchet mechanism for use on a tool having first and second handles pivotally mounted together at a pivot point adjacent one end, said mechanism comprising:

a. a ring-shaped pawl having a first finger projecting laterally therefrom;

b. attaching means pivotally attaching the pawl to the first handle near the pivot point;

c. a guard plate attached to one end by said attaching means to the first handle in overlying relation to the pawl and attached at another end to the pivot point of the first and second handles, said guard plate having an inwardly projecting lance spaced between the two ends;

d. a ratchet plate having a first end, a second end and a curved arm with a plurality of teeth on its outer edge, said arm being spaced from and extending in an arc about the second end, said plate being positioned between the guard plate and the handles and on the same horizontal plane as the pawl with the ratchet plate's first end being pivotally mounted to the second handle and its second end being pivotally mounted at the pivot point of the first and second handles

so that the arm is movably positioned between the pawl and the inwardly projecting lance so that its teeth may engage the pawl for forward compelling motion and the inwardly projecting lance may abutt the arm's inside edge to prevent non-rotational movement of the arm.

4,185,520

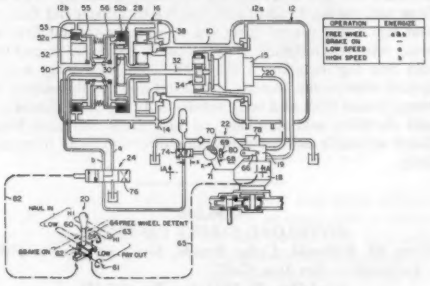
METHOD AND APPARATUS FOR CONTROLLING SPEED AND DIRECTION OF A VEHICULAR TOWING WINCH AND IMPROVEMENTS IN A TOWING WINCH

Richard C. Henneman; Kenneth A. Burdon, both of Bellevue, and Joseph R. Bruce, Seattle, all of Wash., assignors to PACCAR Inc., Bellevue, Wash.

Filed Oct. 18, 1976, Ser. No. 733,150

Int. Cl.[2] F16H *3/44, 57/10*; B66D *1/00, 1/26*

U.S. Cl. 74—750 R **8 Claims**



1. A winch and control system comprising:

a transmission housing,

an input member coupled to a bidirection variable speed fluid motor,

an output member coupled to a drum,

transmission means within said housing between the output and input members, said transmission means including two stages of planetary gearing having portions thereof coupled to two sets of friction locking members for selectively operatively coupling the portions of the two stages for providing the four functions of a low-speed range, a high-speed range, freewheel and drum locked, said drum locked condition occurring by locking said output member through said friction locking members to the interior of said housing, and

means for selectively actuating said friction locking members.

4,185,521

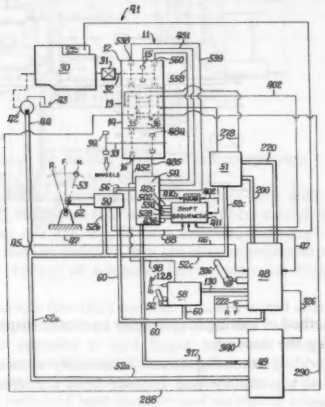
HYDRAULIC CONTROL SYSTEM FOR A HYDROSTATIC-MECHANICAL TRANSMISSION

Charles E. Beals, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 556,852, Mar. 10, 1975, abandoned. This application Nov. 14, 1977, Ser. No. 851,006

Int. Cl.[2] B60K *41/16;* F16H *47/00*

U.S. Cl. 74—865 17 Claims



1. A control system for a transmission which has mechanical input and output sections with means for establishing a plurality of speed ranges and which has a hydrostatic section for infinitely varying the drive ratio of said transmission at each of said speed ranges, said hydrostatic section including first and second variable displacement fluid translating devices hydraulically coupled through first and second flow conduits, the control system comprising:

displacement adjustment means coupled to said hydrostatic section for upshifting said transmission in response to increases of a displacement signal and for downshifting said transmission in response to decreases of said displacement signal,

output torque signal means coupled between said first and second flow conduits for producing an output torque signal having a magnitude which is a function of the fluid pressure differential therebetween,

an accelerator member movable by an operator and a selected torque signal generator coupled to said member and having means for generating a selected wheel torque signal having a magnitude which is a function of the position of said accelerator member, and

a displacement control coupled to said selected torque signal generator and said output torque signal means and said displacement adjustment means, said displacement control having means for producing said displacement signal and for modulating said displacement signal to maintain correspondance between said output torque signal and said selected wheel torque signal by adjusting said drive ratio.

4,185,522

PROCESS FOR SETTING AN INCISION DEPTH IN STRIPPING ELECTRICAL CONDUCTOR WIRES AND A DEVICE FOR EXECUTION OF THE PROCESS

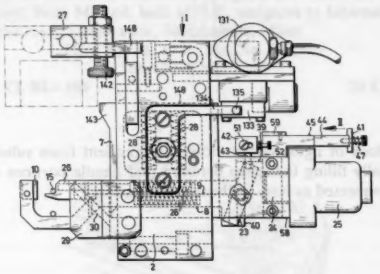
Rudolf Reinertz, and Wolfgang Born, both of Wuppertal, Fed. Rep. of Germany, assignors to Grote & Hartmann GmbH & Co. KG, Wuppertal, Fed. Rep. of Germany

Filed Dec. 15, 1977, Ser. No. 860,762

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1976, 2656938

Int. Cl.[2] H02G *1/12*

U.S. Cl. 81—9.51 13 Claims



1. Process for setting an incision depth in stripping electrical conductor wires with an impact applied thereto, said process comprising:

automatically scanning an outside diameter of a conductor wire to be stripped, said scanning being a mechanical scanning performed by clamping jaw elements of an insulation stripping device;

automatically adjusting the impact to be applied to the conductor wire according to a scanning value obtained from said scanning;

transferring the scanning value from the clamping jaw elements through a coupling system to a lever system and from said lever system to a double wedge arrangement;

using said wedge arrangement as a stop for the insulation stripping device; and

shifting one wedge of the wedge arrangement relative to a counter-wedge of the wedge arrangement while maintaining a parallel relationship between base surfaces of the wedges to obtain a position for the stop.

4,185,523

FLOATING PLIERS

Lloyd D. Kreitz, P.O. Box 60, Pequot Lakes, Minn. 56472

Filed Jun. 1, 1978, Ser. No. 911,387

Int. Cl.[2] B25B *7/02*

U.S. Cl. 81—417 6 Claims

1. A pair of pliers capable of floating in water and hence having particular utility for use in fishing operations such as removing the hook from the throat of a fish, comprising in combination:

a pair of members, each comprising a handle portion, a jaw

portion and an intervening central portion, said members pivotally connected at their central portions, and

a block of light weight closed-cell resilient foam substantially filling the space between said handle portions and connected to both of them therebetween

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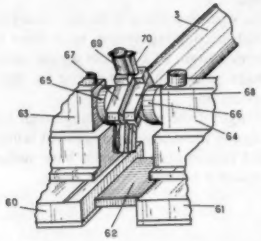
4,185,524

LATHE FOR THE MACHINING OF HOLLOW WORKPIECES

Roland R. Laurent, Le Bourget, France, assignor to Cri-Dan, Paris, France

Filed Sep. 19, 1978, Ser. No. 943,680
Claims priority, application France, Sep. 19, 1977, 77 28201
Int. Cl.[2] B23B *3/18, 21/00*
U.S. Cl. 82—2 R **5 Claims**



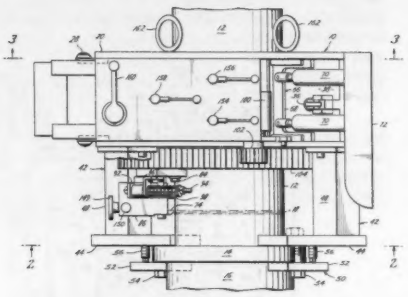
1. An improved lathe having a head-stock for supporting a workpiece on a rotational axis concentric with an interior surface of revolution in the workpiece to be machined, and cutting tool supporting means including a pair of carriages arranged symmetrically with respect to the rotational axis and movable longitudinally and transversely in parallel with a common plane passing through said axis; at least one tool-holder bar supported by each of said carriages and projecting generally parallel to said rotational axis, the cross-sectional configuration of at least one of said tool-holder bars defining a surface parallel to said common plane for supporting the other of said tool-holder bars, the improvement comprising: a longitudinal channel included in one of said tool-holder bars, said longitudinal channel having opposite faces which are parallel to said common plane; and a heel member disposed on the other tool-holder bar, said heel member being slidingly fitted within the logitudinal channel of the other tool-holder bar, said heel member including a pair of slide bearing surfaces for slidingly contacting the other tool-holder bar.

4,185,525

METHOD OF AND APPARATUS FOR CUTTING SUBSTANTIALLY VERTICALLY DISPOSED PIPE

Charles R. Sherer, 4129-C Southerland Rd., Houston, Tex. 77092

Filed Oct. 31, 1977, Ser. No. 845,861
Int. Cl.[2] B23B *5/08, 5/14*
U.S. Cl. 82—4 C **20 Claims**



1. A method of cutting substantially vertically disposed pipe, comprising the steps of:

(a) providing receiving means immovably secured to the pipe at a predetermined distance from a desired cutting plane;

(b) mounting a cutting element on a frame for moving circularly around and radially toward the pipe;

(c) mounting support means on the frame for supporting the frame uniformly about the pipe;

(d) positioning the frame around the pipe;

(e) mounting the support means in immovable relation on the receiving means to locate the cutting element within the desired cutting plane;

(f) securing the frame against movement relative to the vertically disposed pipe, said support means, and said receiving means; and

(g) moving the cutting element circularly around and radially toward the pipe to cut the pipe along the desired cutting plane at the predetermined distance from the frame receiving means.

8. Apparatus for cutting a substantially vertically disposed pipe, comprising:

(a) a frame mountable around the vertically disposed pipe;

(b) a cutting element mounted with said frame for cutting the pipe along a cutting plane;

(c) at least three supports adjustably mounted with said frame for supporting said frame uniformly around the pipe; each said support having

(i) a foot for engaging a receiving member positioned about the pipe and

(ii) a leg mounting the foot to said frame, the leg being adjustably mounted with said frame for locating the cutting element a predetermined distance from the receiving member;

(d) means mounted with said frame for preventing movement of said frame relative to the pipe; and

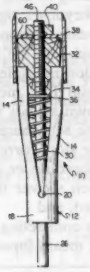
(e) means mounted with said frame for moving said cutting element circularly around and radially toward the pipe to cut the pipe at the cutting plane at the predetermined distance from the receiving member.

4,185,526

HOLDER FOR CIRCULAR FABRIC CUTTER

Vito D'Intino, 4710 Central Ave., Sea Isle City, N.J. 08243

Filed Apr. 10, 1978, Ser. No. 894,893
Int. Cl.[2] B23B *25/00, 5/22;* B26B *3/00*
U.S. Cl. 82—44 **1 Claim**



1. A holder for tubular fabric cutters comprising:

(a) generally cyclindrical base member;

(b) a plurality of generally parallel, radially- and symetrically-disposed, elongated flexible finger members extending coaxially from one end of said base member, and adapted to be moved radially outward into gripping engagement with the internal surface of a tubular fabric cutter for holding the cutter;

(c) a cylindrical first shaft member attached to and coaxial with said base member and extending from the end of said base member opposite to said finger members, whereby said holder may be mounted in a chuck for rotation;

(d) a threaded cylindrical second shaft member attached to and coaxial with said base member and extending coaxially between said finger members;

(e) a frusto-conical plug member mounted coaxially and translatably on said second shaft member between said finger members, and adapted when moved toward said base member to drive the outer portions of said finger members radially outward;

(f) a compression spring surrounding said second shaft member between said plug member and said base member, and adapted when compressed to move said plug member away from said base member thereby permitting the outer portions of said finger members to move radially inward; and

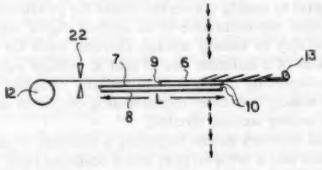
(g) a nut rotatably threaded on said second shaft member adjacent the side of said plug member away from said base member, whereby when said nut is turned in one direction said plug member is moved toward said base member, and when said nut is turned in the other direction said plug member is permitted to move away from said base member.

4,185,527

SLICING MACHINE WITH EXTENSIBLE SLICE TABLE

Fritz Kuchler, Klattenweg 4, A 9010 Klagenfurt, Austria

Filed May 1, 1978, Ser. No. 901,710
Int. Cl.[2] B26D *4/46*
U.S. Cl. 83—88 **12 Claims**



1. In a slicing machine wherein a succession of slices is deposited at a predetermined location, the improvement comprising:

a table at said location having a predetermined starting length and extensible in a predetermined direction to a substantially greater ending length; and

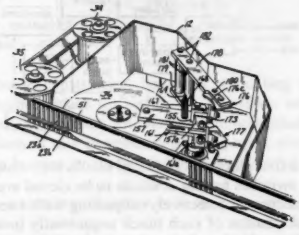
means for extending said table in said direction from said starting length to said ending length as slices are deposited on said table to form on said table a row of slices extending in said direction.

4,185,528

CLEANING APPARATUS FOR DISC CUTTER

Henry K. Andersen, Hasbrouck Heights, and Frank D. Chipchase, West Milford, both of N.J., assignors to International Multifoods Corporation, Minneapolis, Minn.

Filed Apr. 6, 1978, Ser. No. 893,913
Int. Cl.[2] B26D *7/08*
U.S. Cl. 83—168 **24 Claims**



1. Apparatus for cleaning the planar surface of a disc cutter blade having a peripheral cutting edge and which rotates about an axis in a cutting plane, comprising:

(a) frame means rotatable about an axis that is substantially aligned with and spaced from the rotational axis of the disc cutter blade;

(b) means for rotating the frame means;

(c) arm means mounted to the frame means for pivotal movement toward and away from the cutting plane about an axis transverse to the frame means rotational axis, said arm means rotating with the frame means in sweeping movement over the cutting plane,

(d) blade scraping means carried by the arm means and projecting toward the cutting plane;

(e) and actuating means for effecting movement of the arm means away from the cutting plane as the arm means and blade scraping means sweep toward and inwardly beyond the peripheral cutting edge of the disc cutter blade, and for effecting movement of the arm means toward the cutting plane when the blade scraping means overlies the planar surface of the disc cutter blade inwardly beyond its peripheral cutting edge, causing the blade scraping means to engage the planar blade surface at a predetermined point inwardly remote from the peripheral cutting edge and thereafter scrape the planar blade surface as it sweeps thereover.

4,185,529

ELECTRONIC MUSICAL INSTRUMENT

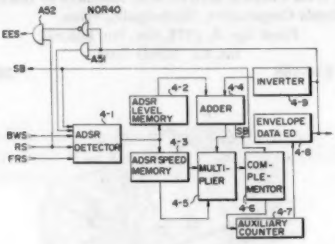
Hiroshi Kitagawa, Hamamatsu, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Filed Dec. 1, 1977, Ser. No. 856,359
Claims priority, application Japan, Dec. 2, 1976, 51/144956; Dec. 2, 1976, 51/144957; Dec. 2, 1976, 51/144958; Dec. 7, 1976, 51/146706; Dec. 7, 1976, 51/146707; Dec. 7, 1976, 51/146708
Int. Cl.[2] G10H *1/06, 5/10*
U.S. Cl. 84—1.01 **12 Claims**

1. An electronic musical instrument comprising an envelope generator which is composed of a cyclic digital filter whose

transfer characteristic changes with the amount of feedback thereto, an envelope level memory for storing its input level to control the waveshape level in accordance with the attack, decay, sustain and release of an envelope waveshape and an envelope speed memory for storing the filter constant of the digital filter to control the envelope speed in accordance with the attack, decay, sustain and release of the envelope waveshape, wherein the transfer characteristic of the cyclic digital filter is controlled by changing the amount of feedback thereto with the output data of the envelope speed memory to generate a required envelope waveshape.

8. An electronic musical instrument comprising a key code generator which is composed of means for sequentially scanning with a first clock a plurality of blocks into which a plurality of key switches having contacts to be closed are divided, a priority selector for selectively outputting with a second clock closure information of each block sequentially in accordance with predetermined priority, means for inhibiting the first clock with an operation signal of the priority selector during its operation to temporarily stop the block scanning and means for converting the output from the priority selector and information of the block scanning to key data of a binary code and means for detecting completion of one scanning to output a variable frame signal of one frame time determined by the number of blocks and the number of closed key switches the converting means operating during each time frame.



4,185,530

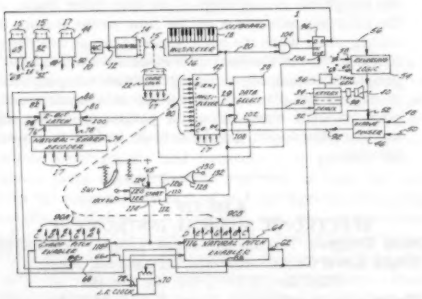
AUTOMATIC GLISSANDO

John W. Robinson, and Stephen L. Howell, both of Jasper, Ind., assignors to Kimball International, Inc., Jasper, Ind.

Filed Sep. 26, 1977, Ser. No. 836,317

Int. Cl.[2] G10H *1/00, 5/00*

U.S. Cl. 84—1.03 **26 Claims**



1. An electronic organ comprising:

a keyboard comprising a set of natural keys and a set of sharp keys,

multiplexer means for scanning said keys and producing a serial data stream having a plurality of time slots corresponding respectively to said keys wherein keydown signals are present in time slots corresponding to depressed ones of said keys,

a plurality of keyers,

demultiplexer means synchronized with said multiplexer means and having an input connectable to receive said serial data stream, said demultiplexer means demultiplexing the serial data received at its input and activating keyers corresponding to time slots in the serial data at its input in which a keydown signal is present,

signal generating means responsive to the depression of a key of one of said sets for automatically generating a second time division multiplexed serial data stream synchronized with said first mentioned serial data stream comprising keydown signals in time slots corresponding to keys of said one set wherein the respective keydown signals in said time slots corresponding to said one set of keys appear in ascending or descending succession at a glissando rate much slower than the rate at which said keyboard is scanned, and

means for selectively connecting said second data stream to said demultiplexer means input.

4,185,531

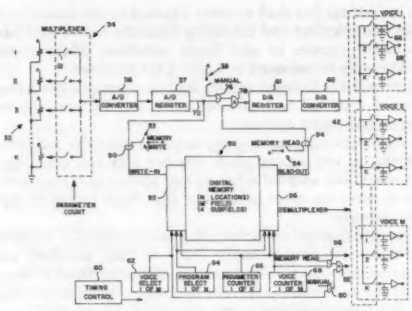
MUSIC SYNTHESIZER PROGRAMMER

Thomas E. Oberheim, Santa Monica, and James L. Cooper, Los Angeles, both of Calif., assignors to Oberheim Electronics, Inc., Santa Monica, Calif.

Filed Jun. 24, 1977, Ser. No. 809,614

Int. Cl.[2] G10H *3/00*

U.S. Cl. 84—1.11 **7 Claims**



6. A programmer suitable for use with an electronic music synthesizer enabling K parameter settings to be manually set and selectively stored and retrieved, said programmer comprising:

a plurality of manually controllable potentiometers for respectively producing K different voltage signals;

an analog to digital converter means for producing a digital output representative of an applied analog input;

multiplexing means for sequentially coupling said plurality of potentiometers to said analog to digital converter means;

means for selectively defining either a manual operation mode or a memory operation mode;

a digital to analog converter means for producing an analog output representative of an applied digital input;

a plurality of analog storage circuits, each for storing the value of a different one of said K voltage signals;

demultiplexing means for sequentially coupling said digital to analog converter means analog output to said plurality of analog storage circuits;

digital memory means including a plurality of storage locations and a write-in port and a read-out port;

means responsive to the definition of said manual operation mode for coupling said analog to digital converter means

digital output to said digital to analog converter means digital input; and

means responsive to the definition of said memory operation mode for coupling said analog to digital converter means digital output to said memory write-in port and said memory read-out port to said digital to analog converter means digital input.

4,185,532

ENVELOPE GENERATOR

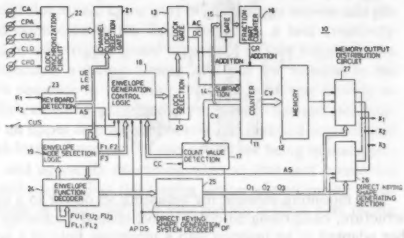
Teruo Hiyoshi; Akira Nakada; Shigeru Yamada; Eiichiro Aoki, and Eiichi Yamaga, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 28, 1977, Ser. No. 837,599

Claims priority, application Japan, Sep. 29, 1976, 51-116776

Int. Cl.[2] G10H *1/02*; G06M *3/00*

U.S. Cl. 84—1.26 **14 Claims**



1. An envelope generator comprising:

(a) a count circuit whose count value is varied by addition or subtraction or combination thereof; and

(b) a conversion circuit for converting the count value of said count circuit into amplitude data corresponding to said count value, so as to generate an envelope having a shape corresponding to variations with time of said count value, and in which;

said count circuit carries out a first computation wherein said count value is subjected to one arithmetic operation selected from addition and subtraction for every predetermined regular time interval, and a second computation in which said count value is subjected to the opposite arithmetic operation with a prescribed timing that does not occur at every one of said predetermined intervals, said combined first and second computation together exponentially varying said count value by polygonal line approximation, so that an envelope having an exponential characteristic is formed by polygonal line approximation computation.

3. An envelope waveshape generator comprising:

a source of clock pulses occurring at a certain rate,

a digital counter connected to be stepped by said clock pulses,

feedback computation means, cooperating with said counter, for modifying the rate at which said counter is stepped by said clock pulses in response to the accrued contents of said counter so as to achieve a certain relationship of accrued count as a function of time, and

conversion means for converting each accrued count to a corresponding amplitude value, the resultant amplitude values comprising an analog envelope waveshape, said conversion means comprising:

a memory circuit having digitally addressable storage locations corresponding to each accrued count of said counter, each storage location including a circuit network for producing an analog amplitude value corresponding to the digital address value of that storage location, said memory circuit being accessed by the contents of said counter.

4,185,533

TOY MUSICAL INSTRUMENT

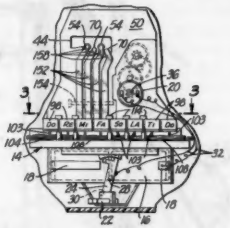
Kenzo Akiyama, and Masaru Ogihara, both of Tokyo, Japan, assignors to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Nov. 13, 1978, Ser. No. 959,621

Claims priority, application Japan, Dec. 28, 1977, 52-157851[U]

Int. Cl.[2] G10D *9/04*; G10F *1/12, 5/06*

U.S. Cl. 84—83 **12 Claims**



1. In a musical instrument having a resonating chamber, sound producing means for setting up resonance within said chamber and valve means for varying the acoustically effective dimensions of said chamber depending upon whether said valve means is open or closed the improvement which comprises:

a second resonating chamber in association with said first resonating chamber,

a second sound producing means for setting up resonance within said second chamber,

a second valve means for varying the acoustically effective dimensions of said second chamber,

each of said valve means being capable of being operated to simultaneously vary the acoustically effective dimensions of both of said chambers,

both of said chambers and both of said valve means being of such dimension that by separate and concurrent operation of said first and second sound producing means and by separate and concurrent opening and closing of both of said valve means it is possible to obtain from said musical instrument eight consecutive notes on a musical scale.

4,185,534

STRINGED MUSICAL INSTRUMENTS WITH FOAMED SOLID BODIES

Les Cove, 546 Chapman St., Hillside, N.J. 07265

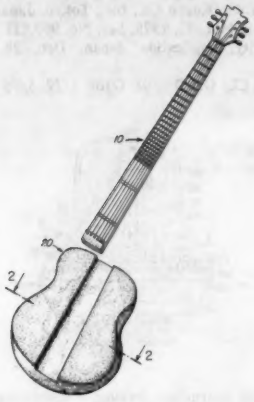
Continuation-in-part of Ser. No. 807,971, Jun. 20, 1977, abandoned. This application Dec. 27, 1978, Ser. No. 970,954

Int. Cl.[2] G10D *3/02*

U.S. Cl. 84—291 **8 Claims**

1. A stringed musical instrument having a solid body with a single surface area to depth ratio in the range of from about

16:1 to about 550:1; a neck assembly, and means connected to said body for receiving said neck assembly; the improvement



comprising fabricating said solid body from a homogeneous foamed polymeric material.

4,185,535

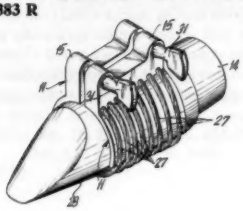
REED-HOLDING DEVICE

Robert A. Lorenzini, 603 S. State Rd. 7, Margate, Fla. 33068

Filed Dec. 11, 1978, Ser. No. 967,986

Int. Cl.[2] G10D *9/02*

U.S. Cl. 84—383 R **7 Claims**



1. A reed-holding device for a mouthpiece of a woodwind instrument comprising:

a pair of brackets, each bracket having a mounting portion with a cross-section which is a partial circumference of a circle adapted to embrace the mouthpiece of a woodwind instrument, each mounting portion having an upper section and a lower section, each bracket having a protrusion extending diametrically outwardly from the upper section of the mounting portion, said protrusions each being located adjacent one another and having a series of substantially equally-spaced holes, each hole being aligned with a corresponding hole within the other protrusion, each mounting portion having a series of substantially parallel equally-spaced grooves extending circumferentially about its lower section, the centerline of each groove being aligned with the centerline of one of said openings;

a string means extending from said aligned holes and extending through the aligned grooves in each bracket; and

fastening means partially coextensive with said protrusions for tensioning said string means.

4,185,536

MOUNTING ELEMENT

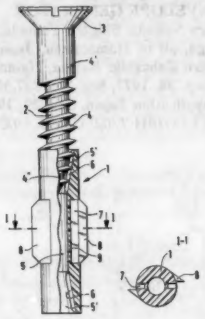
Artur Fischer, Weinhalde 34, D-7244 Waldachtal 3 (Tumlingen), Fed. Rep. of Germany

Filed Jan. 27, 1978, Ser. No. 873,086

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1977, 2711605; Apr. 27, 1977, 2718625; Sep. 26, 1977, 2743174

Int. Cl.[2] F16B *13/14*

U.S. Cl. 85—83 **15 Claims**



1. A mounting element for mounting an object to a support structure, comprising an outer sleeve-shaped anchoring member adapted to be inserted into a mounting hole of a support structure, said anchoring member having an inner bore, an axis and two axial ends; an inner threaded member insertable into said inner bore of said anchoring member; means for anchoring said anchoring member in a relatively unyieldable support structure, including a first portion of said anchoring member bounding a first section of said inner bore which has an inner diameter at most equal to the root diameter of the thread of said threaded member so that when the latter is inserted in said first section of said inner bore a respective portion of said anchoring member is clamped between turns of the thread of said threaded member and a wall of the mounting hole in the support structure; and means for anchoring said anchoring member in a relatively yieldable support structure, including at lease two slots formed in a second portion of said anchoring member bounding a second section of said inner bore, and imparting yieldability to said second portion so that when said threaded member is inserted in said second section of said inner bore said second portion of said anchoring member is substantially laterally outwardly displaced as a whole and is thereby clamped against the wall of the mounting hole in the support structure, said first section of said inner bore of said anchoring member being located adjacent to one of said axial ends and having a cross-section which increases towards said one axial end, said inner bore having another such first section formed adjacent to the other axial end and having a cross-section increasing toward said other axial end.

4,185,537

TRIGGER DEVICE FOR AUTOMATIC GUN

Hisao Hayashi, Tokyo, Japan, assignor to Kabushiki Kaisha Kawaguchiya Hayashi, Tokyo, Japan

Filed Nov. 29, 1977, Ser. No. 855,667

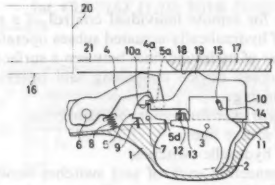
Claims priority, application Japan, Dec. 11, 1976, 51-149158; Jun. 28, 1977, 52-76893

Int. Cl.[2] F41C *19/00*

U.S. Cl. 89—145 **1 Claim**

1. A trigger device for an automatic gun having a firing direction, comprising a receiver, a trigger guard mounted in said receiver, a trigger pivotally attached to said trigger guard and arranged to be pulled by a shooter for firing the gun, a breech block mounted in said receiver upwardly from and

forwardly of said trigger relative to the firing direction, a link extending rearwardly from said breech block and spaced upwardly above said trigger, said link having a guide face directed downwardly toward said trigger, said link forming an opening, a connector located between said guide face of said link and said trigger, said connector is elongated in the firing direction and has a forward end portion extending in the firing direction fowardly of said trigger and a rear end portion positioned above said trigger, a pin secured to and extending outwardly from said rear end portion of said connector transversely of the firing direction, said trigger having an upper part disposed in juxtaposition to the rear end portion of said connector, said upper part of said trigger forming an upwardly extending slot therein disposed transversely of the firing direction, said pin extending into said slot and said slot having a length so that a preset free distance path is provided therein for relative movement between said trigger and said connector when said trigger is pulled and pivots relative to said trigger guard, said slot in said upper part of said trigger moves said pin and said connector in the firing direction, a sear rotatively attached to said trigger guard forwardly of said trigger in the firing direction, a spring biasing said sear for rotation in the direction opposite to the firing direction, said sear having an upwardly extending edge facing rearwardly toward said trigger and an upper face located below and directed toward said link, said forward end part of said connector being in juxtaposition to said upwardly extending edge so that said connector pivots said sear against the biasing action of said spring when said trigger is squeezed, said sear having a claw part facing



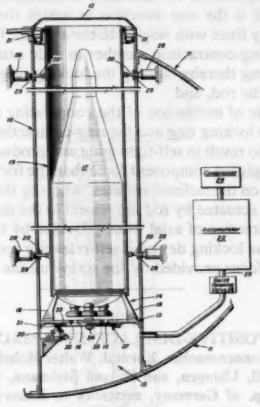
opposite to the firing direction, a hammer pivotally attached to said trigger guard forwardly of said sear and extending rearwardly from the pivot point to adjacent said sear, said hammer having a hook part on the end thereof spaced rearwardly from the pivotal connection and arranged to interengage with said claw part of said sear for holding said hammer in position to fire the gun and said hammer being releasable from said sear when said sear is displaced against the biasing action of said spring associated therewith by said connector, a spring located within said trigger guard and bearing against said hammer for pivotally displacing said hammer forwardly in the firing direction when the interengagement of said sear and hammer is released, a spring mounted on said trigger forwardly in the firing direction from the pivotal connection of said trigger to said trigger guard, said spring mounted on said trigger extends upwardly into contact with said connector and biases said connector upwardly against said guide face on said link, said connector having an upwardly extending protrusion which engages said guide face and restricts the upward biasing action of said spring mounted on said trigger, said breech block and said link being slidably displaceable through said receiver when the gun is fired so that the combination of said breech block and link return said hammer from the released position back into the interengaged position with said sear while the opening in said link allcws said connector to move upwardly due to the biasing action of said spring mounted on said trigger so that said connector is displaced upwardly and the forward end portion thereof is unable to contact said sear for effecting firing of the gun.

4,185,538

SIMPLIFIED AIR SYSTEM FOR UNDERWATER ROCKET LAUNCHING

Edward J. Barakauskas, Saratoga, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 30, 1960, Ser. No. 53,021
Int. Cl.[2] F41F *3/04*
U.S. Cl. 89—1.810 **2 Claims**



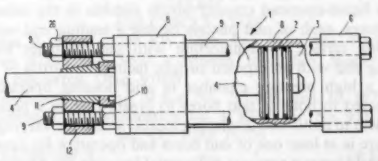
1. A missile launching system comprising a launching tube including a first chamber and a second chamber containing the missile to be launched, a source of gas compressed to a pressure substantially in excess of the pressure of the environment into which the missile is to be launched, and valve means for admitting said compressed gas into said first chamber a bulkhead between said first and second chambers, said bulkhead being formed with a plurality of openings, a plate formed with similar openings mounted for rotation on said bulkhead, and means for rotating said plate to gradually align the openings of the plate with the openings of the bulkhead during the launching movement of the missile in the launching tube to continually increase the flow of compressed gas from the first chamber to the second chamber causing a rapid rise of pressure in said first chamber and resultant constantly increasing pressure communicated to said second chamber via said adjustable orifice for launching said missile.

4,185,539

LOCKING DEVICE FOR HYDRAULIC ACTUATOR

Andrew Stratienko, 8503 Elliston Dr., Philadelphia, Pa. 19118

Continuation-in-part of Ser. No. 775,174, Mar. 7, 1977, Pat. No. 4,097,167. This application Oct. 21, 1977, Ser. No. 844,359
Int. Cl.[2] F15B *15/26*
U.S. Cl. 91—45 **18 Claims**



1. In a hydraulic actuator which includes a movable rod extending from the actuator housing, an infinite-position rod locking device comprising:

a radially contractible locking ring of strong material having a cylindrical inner surface for gripping the rod when the locking ring is contracted and having an axially inclined

outer surface; means for securing the locking ring around the rod in a position axially fixed in only one direction with respect to the actuator housing;

a ring-contracting member around the locking ring and having an inner surface which is axially inclined at the same angle as the outer surface of the locking ring for cooperating with and engaging that surface;

screw means for applying an axial force to the ring-contracting member in the direction of inner surface inclination, which is the one direction in which the locking ring is axially fixed with respect to the actuator housing, to cause the ring-contracting member to slide axially on the locking ring thereby causing the locking ring to contract and grip the rod, and

the angle of inclination of the cooperating tapered surfaces of the locking ring and the ring-contracting member is too high to result in self-tightening and produces a larger axial disengaging component force than the frictional resistance force on the inclined surfaces, whereby the locking device is not actuated by rod movement in the direction opposite the direction of axial force provided by the screw means and the locking device is self-releasing upon release of the axial force provided by the screw means.

4,185,540

POSITIVE-DISPLACEMENT MACHINE

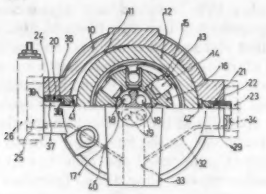
Gerhard Nonnenmacher, Korntal; Walter Robeller, Boeblingen; Karl Veil, Uhingen, and Roland Steimann, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 10, 1978, Ser. No. 895,125

Claims priority, application Fed. Rep. of Germany, May 6, 1977, 2720306

Int. Cl.[2] F04B *13/06*

U.S. Cl. 91—497 **14 Claims**



1. A positive-displacement machine, comprising a housing having a hollow chamber and two diametrically opposed bores each having a first end communicating with said chamber and a second end; closing means for closing said second end of each of said bores; a rotor member positioned in said hollow chamber and adjustably displaceable in the space between said first ends of said bores; means slidably movable in said bores and cooperating with said rotor member for displacing said rotor member in said space, said displacing means comprising a liquid-operated regulating piston slidable in one of said bores and a liquid-operated counter piston slidable in the other of said bores, each of said pistons having a leading end with a working surface communicating with said chamber and a trailing end with an exposed surface facing outwardly of said bore; a high pressure chamber in said housing operatively connected to both of said bores to create therein a pressure sufficient to move said displacing means; means for varying the pressure in at least one of said bores and operative for producing in said bores a pressure differential between the pressure in said bores sufficient to displace said rotor member into a predetermined position; and means in at least one of said bores and connected to said displacing means and operative for increasing the rigidity of the latter, to thereby also increase the stiffness with which said rotor member is engaged by said slidable means during displacement in said space.

4,185,541

METHOD AND APPARATUS FOR HYDRAULICALLY CONTROLLING SUBSEA WELL EQUIPMENT

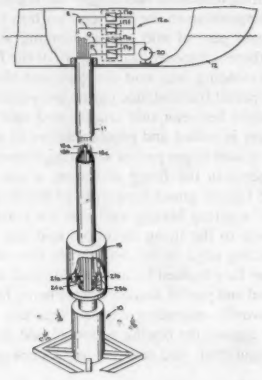
Lionel J. Milberger, and Albert R. Tucker, both of Spring, Tex., assignors to FMC Corporation, San Jose, Calif.

Filed Jan. 30, 1978, Ser. No. 873,323

Claims priority, application United Kingdom, Feb. 26, 1977, 8216/77

Int. Cl.[2] F15B *18/00*

U.S. Cl. 91—526 **21 Claims**



1. Apparatus for remote individual control of a relatively large number of hydraulically-actuated subsea operators using a smaller number of hydraulic lines between a surface control center and a subsea device containing said operators, said apparatus comprising:

a source of hydraulic fluid under pressure;

a plurality of source lines;

a plurality of hydraulic switches;

means for connecting each of said switches between said source of fluid and a corresponding one of said source lines;

a multiple-position valve having a plurality of sections, each of said sections having an inlet port and a plurality of outlet ports;

means for connecting each of said source lines to a corresponding one of said inlet ports of said valve; and

means for connecting each of said subsea operators to a corresponding one of said outlet ports of said valve.

4,185,542

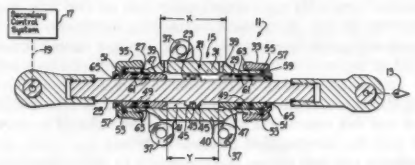
ACTUATOR WITH FRANGIBLE GLAND CONSTRUCTION

Ray A. York, Villa Park, and William D. Simmons, Costa Mesa, both of Calif., assignors to Bertea Corporation, Irvine, Calif.

Filed Feb. 27, 1978, Ser. No. 881,764

Int. Cl.[2] F16J *15/16, 11/02*

U.S. Cl. 92—166 **12 Claims**



1. An actuator comprising:

a housing;

a piston movable in said housing;

a rod coupled to said piston and movable therewith, said rod extending through at least one end of said housing;

a tubular member having an opening extending through the tubular member;

means for mounting the tubular member in the housing with the rod extending through the opening in the tubular member;

at least the portion of the rod axially outwardly of the tubular member being deformable in response to a blow to provide a projection on the rod outwardly of the tubular member whereby movement of the piston and the rod in a direction to move the projection inwardly causes the projection to strike the tubular member and apply a generally axially inward force to the tubular member;

at least one of said mounting means and said tubular member including frangible means responsive to the projection applying an axial inward force to the tubular member of at least a predetermined magnitude to break and allow the piston, the rod and the projection to move further in said direction and to allow at least a portion of the tubular member to move in said direction;

said mounting means and said tubular member being substantially nonfrangible in response to a force applied to the tubular member in an axially outward direction; and

armor means for protecting at least a portion of said housing.

4,185,543

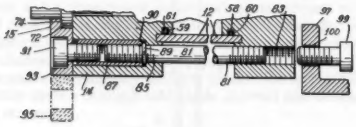
PISTON CYLINDER ASSEMBLY

Eugene S. Ides, 8915 Komensky, Hometown, Ill. 60456

Division of Ser. No. 791,435, Apr. 27, 1977, Pat. No. 4,142,446. This application Aug. 29, 1978, Ser. No. 937,895

Int. Cl.² F16J *11/02*; F01B *29/00*

U.S. Cl. 92—128 **5 Claims**



1. In a piston cylinder assembly adapted to be connected in fluid communication with a source of fluid under pressure and having cylinder means defining an elongated piston chamber and having a pair of end blocks at opposite ends thereof; a piston rod reciprocatively mounted within said piston chamber; a piston fixed to said rod within said chamber; said pair of end blocks each having port means and mounted at opposite ends of said cylinder means in fluid communication with said chamber and adapted to be connected in fluid communication with the source of fluid under pressure to enable said piston to be moved reciprocatively within said chamber; means defining a series of holes extending through said end blocks, some of said holes in one of said blocks being disposed opposite and aligned with corresponding other ones of said holes in the other one of said blocks; a plurality of tie rods having their end portions terminating in the aligned holes in said blocks and interconnecting said blocks, at least one of said end blocks having a face, the combination comprising:

first fastening means disposed within said aligned holes in the last-mentioned one of said end blocks for fixing said rods to said end blocks;

a removable end mounting member overlying the face of said one of said end blocks, said mounting member having holes therein aligned with the corresponding ones of said holes in said one of said end blocks; and

second fastening means extending through the last-mentioned holes into engagement with said first fastening means to fix said mounting member to said one of said end blocks,

wherein said rods are threaded at their opposite ends, said first fastening means includes sleeve nuts; and said second fastening means includes bolts threaded into said sleeve nuts.

4,185,544

PISTON FOR COMBUSTION ENGINES

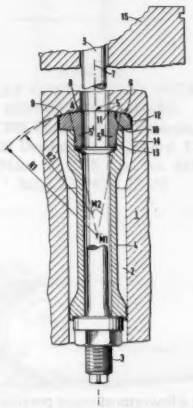
Frantisek Kolar, Stuttgart, Fed. Rep. of Germany, assignor to Mahle GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 19, 1977, Ser. No. 834,212

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1976, 2647250

Int. Cl.² F16J *1/00*

U.S. Cl. 92—220 **3 Claims**



1. In a piston having an upper piston part and a lower piston part connected together by an expansion screw, the provision of:

a boring in said lower piston part;

an expansion socket in said boring, said expansion screw extending through and resting on said expansion socket;

a concave supporting surface formed in said boring, having its centre of radius of curvature positioned on the longitudinal axis of said boring, and having radially inner and outer limits;

a multi-part head portion detachably formed on said expansion socket, and

a convex supporting surface formed on said head portion, having a radius of curvature less than the radius of curvature of said concave surface, having its centre of radius of curvature positioned outside said longitudinal axis and having radially outer and inner limits, the arrangement being such that tangential contact between said convex and concave surfaces occurs intermediate said radially inner limits of said concave and convex surfaces and said radially outer limits of said concave and convex surfaces.

4,185,545

AIR CIRCULATOR

Douglas B. Rusth, 1335 SW. 66th Ave., Apt. 404, Portland, Oreg. 97225, and David A. Martin, 14025 SW. Bonny Brae Ct., Beaverton, Oreg. 97005

Continuation-in-part of Ser. No. 757,898, Jan. 10, 1977, abandoned. This application Jul. 3, 1978, Ser. No. 921,731

Int. Cl.² F24F *13/06*

U.S. Cl. 98—33 A **6 Claims**

1. An air circulator for circulating heated convective air for attachment to a roof or ceiling structure of a room, said air circulator comprising,

a duct formed from a pliable film material suspended from its upper end and discharging an airflow towards the floor area of the room,

a fan and motor assembly,

a support structure including a dome shaped base to which said fan and motor assembly is attached,

hanger means suspending the support structure from an overhead structure,

said support structure additionally including mounting means partially enclosed by said base and to which the upper end of said duct is attached whereby the duct is in axial relationship with the fan of the fan and motor assembly,

said base having a lowermost outer portion outwardly offset from said mounting means and the upper end of said duct,

said base receiving a fan induced flow of heated convective air from that area of the room subjacent the roof or ceiling structure for subsequent downward flow into the duct upper end and passage via said duct and discharge into an area superjacent the floor of the room to heat the latter area, and

flow restriction means within the lower portion of said duct for duct inflation.

4,185,546

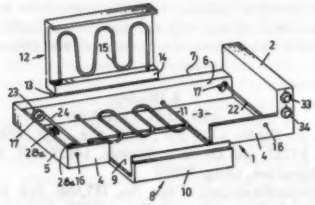
COOKING APPARATUS

Ladislav S. Karpisek, Sydney, Australia, assignor to Zeus Industries Pty. Limited, Naringbah, Australia

Filed Jun. 29, 1978, Ser. No. 920,487

Int. Cl.[2] A47J *37/08*

U.S. Cl. 99—386 **8 Claims**



1. A toaster comprising a base housing an exposed heating element, a lid housing an exposed heating element and mounted on the base with the elements in spaced apart overlying relationship, a walking beam conveyor to transport articles to be toasted by the elements between the two heating elements, the conveyor comprising a first stationary grid made up of a plurality of parallelly spaced bars and a moving grid made up of a plurality of parallelly spaced bars, the grid having similar arrangements of bars and at least portions of the bars being angled to the direction of conveying, grid advancing means supporting the moving grid and drivingly connected thereto, to raise said moving grid and advance it while in a raised position, and to lower said moving grid between the bars of the stationary grid and retract it while in a lowered position, the distance of advance of the moving grid being less than the pitch between the portions of adjacent bars of the stationary grid angled to the direction of conveying.

4,185,547

APPARATUS FOR MANUFACTURING READILY SOLUBLE GRANULAR SUBSTANCES FROM POWDERED MATERIALS

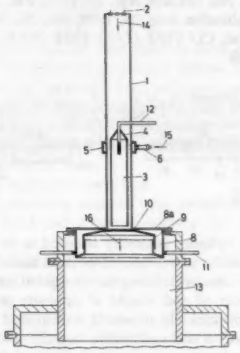
Motoyasu Nakazato; Akira Tokumaru, both of Tokorozawa; Toshitaka Kobayashi, Ogose, and Akio Kamishima, Higashimurayama, all of Japan, assignors to Meiji Nyugyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1978, Ser. No. 886,577

Claims priority, application Japan, Nov. 4, 1977, 52-132939

Int. Cl.[2] A23C *9/16, 11/00*; A23F *1/00*

U.S. Cl. 99—453 **9 Claims**



1. An apparatus for producing readily soluble granular substances from powdered materials, said apparatus comprising:

a vertical outer hollow cylindrical casing open at the top thereof and adapted to receive said powdered materials through said top opening;

a vertical inner hollow cylindrical casing having a lesser diameter than and being shorter than said outer casing, said inner casing being closed at the top thereof, open at the bottom thereof, and concentrically positioned within said outer casing at the lower portion thereof, the difference in diameters of said inner and outer casings forming a gap between both of said casings;

pneumatic air supply means connected through said outer casing for introducing compressed air into said outer casing substantially tangential to the inner surface thereof, whereby a whirling air stream is produced along the inner surface of said outer casing;

first steam supply means connected to said inner casing for introducing a stream of steam thereinto; and

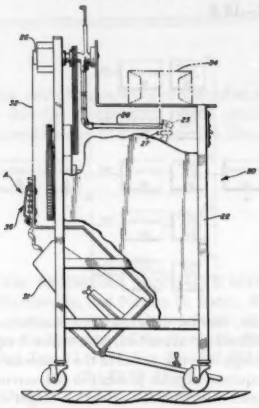
second steam supply means surrounding the lower end of said outer casing for supplying steam into said outer casing opposite the lower end of said inner casing.

4,185,548

TENSIONER DEVICE FOR PACKAGE TYING MACHINE

Paul Pierce, Jr., LaGrange, and Robert G. Beedy, Hometown, both of Ill., assignors to B. H. Bunn Company, Alsip, Ill.

Filed Apr. 3, 1978, Ser. No. 892,995
Int. Cl.[2] B65B *13/10*
U.S. Cl. 100—27 10 Claims



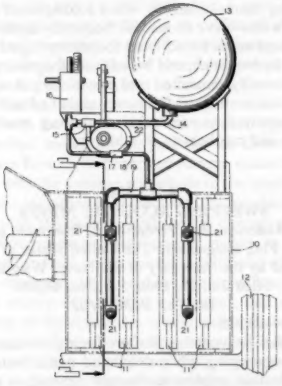
1. An apparatus for tensioning tie material in a package tying machine, comprising in combination, plate means mounted on the package tying machine, guide means aligned longitudinally of said plate means and characterized by a guide channel therealong said guide channel characterized as having an enlarged inlet end and a constricted outlet end, spring means mounted on said plate means and operable to resiliently engage the same at a position substantially at said constricted outlet end of said guide channel, whereby to form a substantially uniform cross section and a substantially uniform tension for tie material as it is forcibly drawn through said guide channel and beneath said spring means.

4,185,549

BALE INJECTION SYSTEM

Alan N. Roepnack, R.D. #1, Richfield Springs, N.Y. 13439

Filed Feb. 27, 1978, Ser. No. 881,561
Int. Cl.[2] B30B *15/30*
U.S. Cl. 100—45 27 Claims



1. An improved baler of the type having a reciprocating plunger for compacting fibrous materials, said plunger being operable between an advanced position for compacting materials and a withdrawn position for receiving materials to be compacted, wherein the improvement comprises:

means connected to the plunger for injecting a fluid into the mass of fibrous materials being compacted; and

storage means communicating with the injecting means for storing under pressure and supplying under pressure the fluid to be injected; and

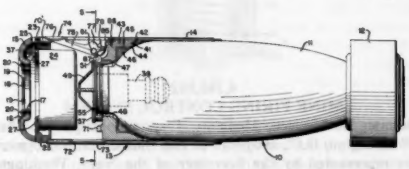
control means responsive to the position of the plunger and communicating between the injecting means and the storage means for terminating the supply of fluid to the injecting means at least when the plunger is in the withdrawn position.

4,185,550

MINESWEEP OBSTRUCTOR WITH CABLE DISPENSING MEANS

Charles C. Vogt, 7208 Denton Rd., Bethesda, Md. 20014, and Royal Weller, 620 Deodan Ave., Oxnard, Calif. 93030

Filed Mar. 18, 1955, Ser. No. 495,369
Int. Cl.[2] F42B *22/10*
U.S. Cl. 102—13 8 Claims



1. In a mooring device for an aerial launched mine adapted to be dropped into a body of water, in combination, a buoyant member, a casing releasably locked to said member and separable therefrom upon impact of the device with the water, locking means including a plurality of detents carried by said casing for releasably locking the casing to said member, impact responsive means mounted on the casing for releasing said locking means in response to said impact, and a length of mooring cable arranged to be payed out as the casing separates from said member and sinks to the bed of the body of water for mooring the mine beneath the surface of the water.

4,185,551

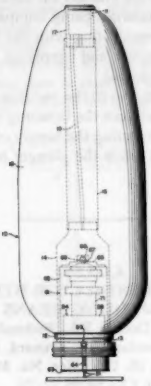
UNDERWATER CABLE CUTTING DEVICE

Bernard E. Drimmer, Brentwood, and Everett L. Moffett, Laurel, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 6, 1951, Ser. No. 260,292
Int. Cl.[2] F42B *22/42*
U.S. Cl. 102—15 7 Claims

1. A sweep wire destroying device of the character disclosed comprising a buoyant member adapted to cause the device to float within a body of water, means including a cable for mooring the device within the water, a movable annular member disposed about said cable for engagement by a sweep wire, a tubular member on said device for slideably supporting said annular member, a shaped charge disposed within the device in adjacency to said annular member, means including a liner forming a toroidal air chamber abutting the lower surface of said charge, means including a primer controlled by said annular member for firing said shaped charge when the annular member is engaged by said sweep wire, and means including an inert mass arranged within said charge intermediate the primer and said liner for (initially controlling the application of force

of the explosion in such manner that the explosive wave is applied uniformly and symmetrically to the toroidal surface of



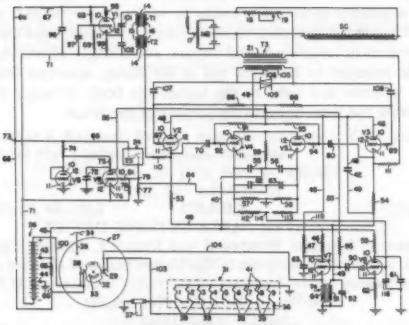
said liner as the shaped charge is fired thereby to sever said sweep wire.

4,185,552

MINE FIRING CONTROL SYSTEM

Whitman D. Mounce, Houston, Tex., and Ralph W. Mann, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 16, 1945, Ser. No. 594,133
Int. Cl.[2] F42B *22/26*
U.S. Cl. 102—18 M **17 Claims**



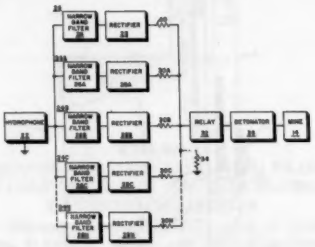
1. In a mine firing control system of the character disclosed, the combination of a mine firing control circuit including a plurality of electron discharge devices each of which is adapted to be rendered conducting when the bias voltage thereon is elevated to a predetermined value, circuit means including a first normally conducting electron discharge device for applying said bias voltage to said plurality of electron discharge devices, circuit means including a second normally non-conducting electron discharge device adapted to render said first electron discharge device non-conducting as said second electron discharge device is rendered conducting, means controlled by said mine firing control circuit for rendering said second electron discharge device conducting as the control circuit operates, and means for operating the control circuit.

4,185,553

DEVICE FOR DISTINGUISHING A SINE-WAVE SIGNAL FROM AN INCREASE IN BACKGROUND NOISE

Wesley G. Houser, State College, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 22, 1963, Ser. No. 267,902
Int. Cl.[2] F42B *22/04*
U.S. Cl. 102—18 R **5 Claims**



3. In a mine, having an exploding mechanism capable of detecting underwater acoustical sine-wave frequency signals emitted by a large moving vessel in the presence of broad-band acoustical frequency signals present in the surrounding water, when said vessel is within the effective target distance of the mine, the combination comprising:

a hydrophone adapted to receive acoustical sine-wave frequency signals emitted by said large moving vessel and broad-band acoustical frequency signals present in the surrounding water;

a plurality of narrow band-pass contiguous filters connected to the output of said hydrophone, each of said filters tuned to adjacent portions of the frequency spectrum emitted by said vessel;

a plurality of rectifiers, one rectifier connected to the output of each of said filters, the polarity of each of said rectifiers being opposite to that of each of said rectifiers immediately adjacent thereto;

a plurality of summing means, one summing means connected to the output of each of said plurality of rectifiers, said plurality of rectifiers and said plurality of summing means so connected and so correlated as to cancel said broad-band acoustical frequency signals and to pass said sine-wave frequency signals emitted by said vessel; and

a mine exploding mechanism connected to said plurality of summing means, whereby when a compound signal comprising a sine-wave acoustical frequency signal emitted by said vessel and a broad-band frequency signal is detected by said hydrophone, said broad-band frequency signal will be electrically cancelled and the electrical signal represented said acoustical frequency signal of said vessel will be transmitted to said mine exploding mechanism and actuate said mechanism of said mine.

4,185,554

SWEEPING ACOUSTIC MINES

Richard K. Anderson, and Frederick A. Rohrman, both of Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 28, 1960, Ser. No. 46,036
Int. Cl.[2] B63G *7/02*
U.S. Cl. 102—18 MS **2 Claims**

1. An explosive assembly for producing an acoustic signature for minesweeping when detonated under water comprising a flexible line, explosive charges secured to said line at spaced points along the length of said line, the explosive content of said charges varying by increments from a minimum to a maximum at a substantially constant rate, the overall assembly having a weight-in-water so distributed that when the

assembly is unrestrained in water the force of gravity places all segments of said line under tension, and means for firing said charges in rotation in the order of their ascending magnitude of

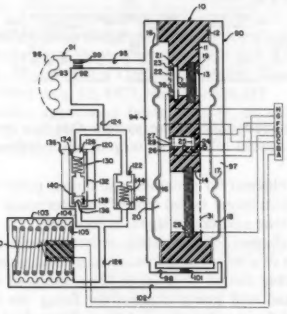
explosive content, said charges being so spaced and distributed along said line that the combination of the spacing and the firing sequence renders said charges separate charges.

4,185,555

ELECTROLYTIC PRESSURE SENSITIVE MECHANISM

Louis Wilson, Hyattsville, and Nelson N. Estes, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 11, 1953, Ser. No. 361,102
Int. Cl.[2] F42B *22/04*
U.S. Cl. 102—18 R **10 Claims**



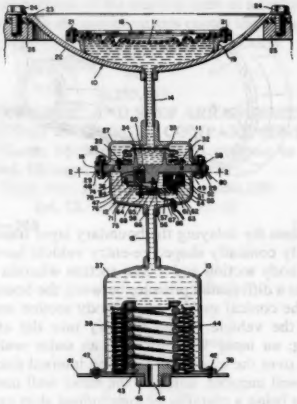
8. A pressure sensitive submarine mine firing apparatus comprising an electrolytic cell including a pair of separate chambers, passage means including an orifice electrode communicating said chambers, means for maintaining an ion concentration gradient between said chambers, pressure sensitive means for causing the electrolyte to flow from one chamber to the other chamber through said passage means variably in accordance with the magnitude of the pressure signals applied to the apparatus, means for varying the ion concentration of the electrolyte flowing through said passage means inversely in accordance with the average magnitude of the applied pressure signals, means including said electrode for producing a signal correlative with the quantity and the ion concentration of the electrolyte flowing through said passage means, an electrolytic integrator cell in fluid communication with one of said chambers, a pair of electrodes in said integrator cell, circuit means including a source of potential connecting said orifice electrode and one of the electrodes in said integrator cell whereby the ion concentration of said integrator cell is increased in accordance with the rate of ion flow through said orifice electrode, a second circuit means including a source of potential and a firing relay connecting said pair of electrodes in said integrator cell, and means for selectively shunting said relay to thereby vary the magnitude of the pressure signal necessary to actuate the relay.

4,185,556

MINE FIRING SYSTEM

Joseph F. Keithley, Washington, D.C., and Matthew L. Sands, Santa Fe, N. Mex., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 6, 1945, Ser. No. 597,930
Int. Cl.[2] F42B *22/04*
U.S. Cl. 102—18 M **16 Claims**



1. In a submarine mine, a normally open mine firing circuit, a timing device operable in unit cycles and having means for closing said firing circuit partially during a cycle of operations thereof, and pressure and magnetic responsive means each of which is adapted to either initiate a cycle of operations of said timing device or to complete said firing circuit during a cycle of operations of the timing device selectively in accordance with the sequence of response of said pressure and magnetic means.

4,185,557

STRESS REDUCING LINER AND METHOD OF FABRICATION

Howard W. Gerrish, Jr., China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 28, 1972, Ser. No. 249,457
Int. Cl.[2] F42B *1/00*
U.S. Cl. 102—103 **2 Claims**

1. A method of fabricating a stress reducing liner for a solid propellant rocket motor, said method comprising the steps of:

(a) coating the inner surface of a rocket motor casing with a first curable polybutadiene based mixture;

(b) simultaneously heating and spinning the casing to cause said first polybutadiene based mixture to cure in an even layer on the inner surface thereof;

(c) covering the cured polybutadiene based layer with a sheet of solid silicone rubber which has been perforated and which is sized to fit the inner surface of said rocket motor casing;

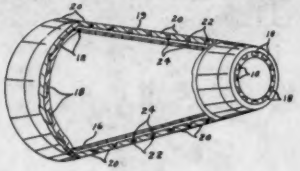
(d) coating the inner surface of the layer of perforated silicone rubber with a second curable polybutadiene based mixture; and

(e) simultaneously heating and spinning the casing to cause the second polybutadiene based mixture to cure in an even layer on the inner surface of the silicone rubber layer and bond to the first polybutadiene based layer by means of columns through said perforations in the silicone rubber layer.

4,185,558
RE-ENTRY VEHICLE BOUNDARY LAYER TRANSITION SUPPRESSOR

James A. Quinville, Redlands, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 23, 1968, Ser. No. 725,582
Int. Cl.[2] B64C *1/38*
U.S. Cl. 102—105 1 Claim

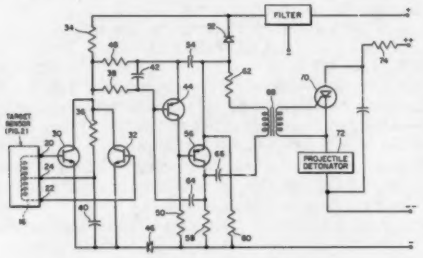


1. A system for delaying the boundary layer transition for a substantially conically shaped re-entry vehicle having a nose section, a body section and a base section wherein there normally exists a differential pressure between the boundary layer adjacent the conical surface of the body section and the base region of the vehicle during re-entry into the atmosphere, comprising: an inner wall member; an outer wall member, positioned over the inner wall member; internal duct means in the inner wall member, adjacent the outer wall member; said duct means being a plurality of longitudinal slots extending to the base region of the vehicle; said slots meeting in a common exit orifice at the base region of the vehicle means, including a plurality of annular nozzle orifices on the conical surface of said vehicle, for providing a choked flow of gases from the boundary layer into said duct means, whereby an automatic altitude compensated pump is provided for the suction flow of gases from the boundary layer to the base region of the vehicle.

4,185,559
AMPLIFIER FOR MISSILE DETONATOR

William R. Little, Seattle, Wash., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 12, 1963, Ser. No. 294,773
Int. Cl.[2] F42C *13/00*
U.S. Cl. 102—211 5 Claims



1. In a circuit for detonating a projectile at its point of closest approach to a target toward which the projectile has been launched, said projectile incorporating a sensor for developing an electrical wave which increases in magnitude as the projectile approaches the target and then drops to zero at the point of closest approach of the projectile to the target in the event that there is no contact therebetween, said circuit comprising:

(a) a balanced push-pull input amplifier receiving the electrical wave developed by said sensor and acting to generate a signal output of negative polarity as the said electrical wave drops to zero following a rise in amplitude as the projectile approaches its target;

(b) a clipper-amplifier to which the signal output of said push-pull input amplifier is applied, said clipper-amplifier being initially cut off and being rendered conductive by the application thereto of the output of said push-pull amplifier to develop a square-wave voltage;

(c) a phase inverter connected to said clipper-amplifier and providing positive feedback thereto;

(d) an energy-storage device receiving the square-wave voltage developed by said phase inverter and acting to generate a firing signal;

(e) a power switch actuated to closed position by the firing signal produced by said energy-storage device when said firing signal has reached a a predetermined value;

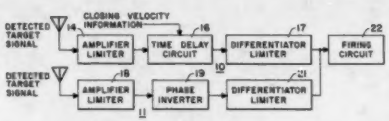
(f) a projectile detonator;

(g) and a network including said projectile detonator and said power switch, said network being energized by the closing of said power switch to detonate said projectile.

4,185,560
FORE AND AFT FUZING SYSTEM

Mayer Levine, 10658 Cass St., Arlington, Calif. 92503

Filed Jan. 31, 1962, Ser. No. 170,286
Int. Cl.[2] F42C *13/04, 13/02*
U.S. Cl. 102—214 7 Claims



1. In a guided missile fuze system that has optimum kill probability against all sizes of targets, the combination comprising:

(a) a fuzing channel for generating an output pulse in response to a received target signal after a predetermined time delay from the time said target signal is received,

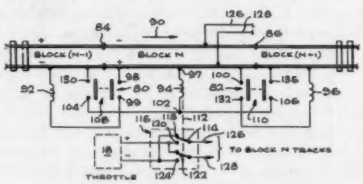
(b) a guard channel for generating an output pulse in response to the loss of a target signal detected by said guard channel,

(c) and a firing circuit coupled to the outputs of said fuzing channel and said guard channel for firing the fuze in response to a firing pulse received from either of said channels.

4,185,561
AUTOMATIC SWITCHING SYSTEM

Joseph Reymann, 953 Avenida Ladera, San Dimas, Calif. 91773

Filed Jul. 22, 1977, Ser. No. 817,981
Int. Cl.[2] B61B *13/12;* B60L *9/00*
U.S. Cl. 104—153 2 Claims



1. An automatic polarity switching apparatus for controlling the polarity of the electrical potential applied to first and second blocks of model railroad tracks which are electrically insulated from one another, comprising:

first and second polarity switch members, each adapted to couple a means for providing such electrical potential to

said first and second track blocks, respectively, said polarity switch members adapted to reverse the polarity of the potential applied to the respe tive track block when activated by an actuating signal;

first and second relay means, each having first and second inputs and an output, each relay means adapted to produce an actuating signal at said output when a potential is developed across said inputs, said first inputs of said first and second relay means coupled to a first rail of said respective track blocks;

bi-directional switch means actuated by the presence of a train on one of said track blocks, and adapted to couple said second input of said second relay means to said first rail of said first track block when actuated by a train on said first track block, and to couple said second input of said first relay means to said first rail of said second track block when actuated by a train on said second track block; and

said outputs of said first and second relay means coupled to said first and second polarity switch means, respectively, for activating one of said polarity switch members to change the polarity of the potential applied to one of said track blocks to be the same as the potential applied to the other track block;

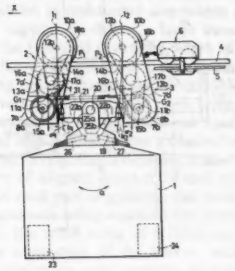
whereby a train proceeding from either one of said track blocks to the other track block will actuate the switching apparatus so that the polarity of the potential of the next-to-be-encountered track block is the same as the polarity of the block on which the train is currently traveling.

4,185,562

SUSPENDED DRIVING RAILWAY CAR

Yukiyoshi Hatori, and Shinji Katayose, both of Tokyo, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Aug. 12, 1977, Ser. No. 824,317
Claims priority, application Japan, Aug. 31, 1976, 51-103880
Int. Cl.[2] B61B *3/02, 7/06, 7/12;* **B61C** *13/06*
U.S. Cl. 105—152 **10 Claims**



1. In combination with a trackway of an aerial trackway system, a vehicle comprising:

a depending vehicle body;

a first traction unit having structure supporting said vehicle body and having a drive unit having a driven traction supporting wheel rotatably mounted thereon, said supporting wheel of said first traction unit being disposed on said trackway;

a second traction unit having structure supporting said vehicle body and having a second drive unit having a driven traction supporting second wheel rotatably mounted thereon, said second supporting wheel of said second traction unit being disposed on said trackway;

said first traction unit supporting said vehicle body at a front location and being rotatable about a substantially vertical axis relative to said vehicle body such that said supporting wheel of said first traction unit may follow said trackway;

said second traction unit supporting said vehicle body at a rear location and being rotatable about a second substantially vertical axis relative to said vehicle body such that said second supporting wheel of said second traction unit may follow said trackway; and

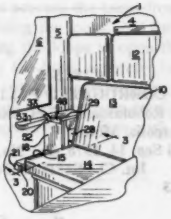
a single link extending between said first and second traction units so that rotation of said first and second traction units in the same rotational direction about said first and second substantially vertical axes respectively, due to the movement of said vehicle along said trackway, is restricted so that rotation of one of the traction units in a first rotational direction about its respective axis causes the other traction unit to rotate in the second opposite direction.

4,185,563

COMBINATION SEAT AND STEP ARRANGEMENT FOR RAILWAY PASSENGER COMPARTMENT

Ronald W. Marsh, Michigan City, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed Nov. 10, 1977, Ser. No. 850,190
Int. Cl.[2] B61D *31/00, 33/00*
U.S. Cl. 105—345 **11 Claims**



1. A combination seat and step arrangement for providing access to an upper bed of a railway car compartment,

said seat comprising a seating section and a backrest section,

a lateral extension assembly of said seating and backrest sections comprising a seating extension and backrest extension, said seating extension comprising front and rear sections substantially coextensive with one end of said seating section and said backrest extension having upper and lower portions substantially coextensive with a corresponding end of said backrest section,

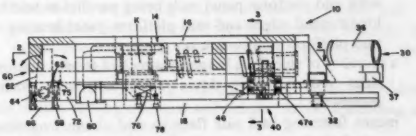
the front section and the upper portion being pivotably connected along and positionable generally normal to said seating and backrest sections, respectively, and having distal end portions adapted to interengage in stable supporting relation to each other to form a step providing means for access to said upper bed.

4,185,564

TRAILER HITCH YOKE POSITIONING ASSEMBLY

Patricia S. Stoller, St. Louis; James C. Hammonds, St. Charles; John O. Kloepper, Moline Acres, and Arnold Schlobohm, Ballwin, all of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Oct. 25, 1977, Ser. No. 844,665
Int. Cl.[2] B61D *3/16, 45/00;* **B65J** *1/22;* **F16B** *9/02*
U.S. Cl. 410—64 **12 Claims**



1. In a trailer hitch having a pair of movable jaws pivotably

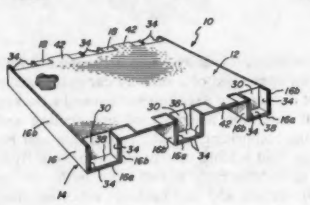
mounted relative to a hitch housing and adapted to assume a first closed position engaging and holding in place the kingpin of a piggyback trailer; jaw resilient means biasing said jaws toward an open position; yoke resilient means biasing a yoke into a first engaged position engaging said jaws to maintain said jaws in said first closed position; the improvement comprising: a cam assembly comprising a cam plate rotatably mounted upon said hitch housing having a cam surface which engages said yoke to move said yoke from said first engaged position to a second remote position; means for moving said cam plate causing said yoke to move from said first position to said second remote position, allowing said jaws to assume an at least partially open position relative to the kingpin due to the bias of said jaw resilient means; and stop means mounted on the hitch adapted to be automatically actuated by movement of said cam assembly whereby to move said stop means into a stop position engaging and preventing return of said yoke to said first engaged position, allowing said jaws to assume said partially open position to facilitate removal of said kingpin from said jaws.

4,185,565

CORRUGATED PALLET

John A. Nymoen, Robbinsdale, Minn., assignor to Liberty Carton Co., Minneapolis, Minn.

Filed Sep. 14, 1978, Ser. No. 942,194
Int. Cl.[2] B65D *19/34*
U.S. Cl. 108—51.3 **5 Claims**



1. A pallet which comprises:

a base constructed of a piece of sheet material which comprises:

a plurality of spaced, parallel, upwardly opening channel members, each of said channel members having a bottom and two sides, each side having a top longitudinal edge,

at least one platform reinforcing portion extending between the top longitudinal edges of facing sides of adjacent channel members, whereby adjacent ones of said channel members are foldably connected and spaced apart at said top longitudinal edges by a reinforcing portion,

a platform piece constructed of a substantially rectangular piece of sheet material comprising:

a platform panel having first and second sides and first and second ends, said platform panel overlying said base with said platform panel ends being parallel to said top longitudinal edges and said platform panel bearing on said platform reinforcing portion,

a plurality of side flaps hingedly attached to said platform sides and extending downwardly into said channel members,

means fastening said side flaps to said channel members said fastening means comprises at least one tab foldably attached to each of said side flaps and secured to a respective channel member.

4,185,566

BENDIBLE BRACKET

Carl Adams, 7255 Fulton Ave., North Hollywood, Calif. 91605

Filed Jul. 8, 1977, Ser. No. 813,959
Int. Cl.[2] A47F *5/00*
U.S. Cl. 108—152 **9 Claims**

1. A bendable bracket including:

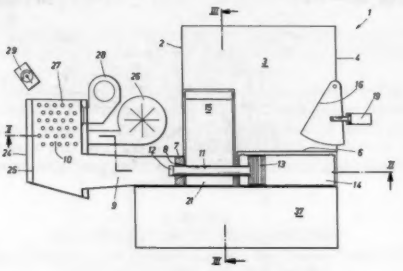
an elongated strip having a pair of elongated beads therein, said bracket having an upturned first end and an upturned second end and a bend area, said bend area including a first pair of dimples and a second pair of dimples spaced apart and aligned on opposite sides of said bend area.

4,185,567

WOOD-FIRED FURNACE ASSEMBLY WITH AUTOMATIC FIRE CHAMBER CHARGER

Hans Grossniklaus, Garage, 3855 Brienz, Switzerland

Filed Apr. 5, 1978, Ser. No. 893,256
Claims priority, application Switzerland, Apr. 6, 1977, 4347/77
Int. Cl.[2] F23M *1/06*; F23K *5/00*
U.S. Cl. 110—101 R **17 Claims**



1. A wood-fired furnace assembly having a fire chamber **(10)** and an automatic charging device for the fire chamber, comprising a container **(1)** adapted to receive wood and having a bottom **(6,21; 38,39)** and side-walls **(2-5)** adjacent the bottom, an aperture **(8)** reinforced at its edge connected in the lower edge of one of the side-walls **(2)**, a feed duct **(9)** connected between said aperture **(8)** and the fire chamber **(10)**, a ram **(11)** having a free end **(12,59)** facing said aperture **(8)**, said free end having a cross-section the same as or smaller than the cross-section of said aperture **(8)**, a drive device **(13,14,30)** connected to reciprocate said ram **(11)** along a path in the container **(1)** to position said free end **(12,59)** at the end of the working stroke up to or into said aperture **(8)**, the bottom of said container **(1)** having a region **(21,38)** adjoining said one side-wall **(2)** having said aperture **(8)** therein extending transversely of and on opposite sides of the path of said ram **(11)** and extending approximately horizontally or inclinded downwardly away from opposite sides of said ram, the transverse dimension of said region being a multiple of the inside width of said aperture **(8)** so that wood in said container **(1)** being bigger than the inside

width of said aperture (8) can get into a transverse position in front of the aperture (8) and upon the working stroke of the ram (11) can be pushed against the aperture (8) and splintered thereat under pressure from the free end (12,59) of the ram, and a respective pusher member (15,17; 41,43) mounted in each of the two side-walls (3,5) adjoining said one side-wall (2) having said aperture (8) therein which is moved to and fro in the direction toward the path of said ram (11) by means of a respective drive device (18,20, 30; 48), whereby wood lying against the said two side-walls (3,5) is pushed toward said ram path.

4,185,568

CUTTING INSTRUMENTALITIES FOR TUFTING MACHINES

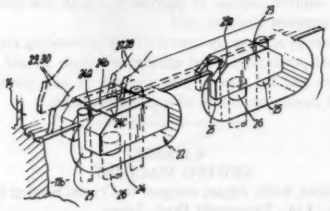
Harold B. Bardsley, Euxton, Nr. Chorley, and Harry Priestley, St. Annes on Sea, both of England, assignors to Spencer Wright Industries, Inc., Chattanooga, Tenn.

Filed Aug. 16, 1978, Ser. No. 934,001

Claims priority, application United Kingdom, Mar. 1, 1978, 8096/78; Aug. 31, 1978, 36281/78

Int. Cl.[2] D05C *15/00*

U.S. Cl. 112—79 R **11 Claims**



1. In a tufting machine having a knife bar support member extending longitudinally of the machine, a cutting instrumentality including a multiplicity of knife bar modules, means for mounting said modules in end-to-end disposition collectively on said knife bar support to define a knife bar of a length coextensive with the intended operating width of the tufting machine, a multiplicity of knife blocks, said modules and said knife blocks having cooperable means for mounting a multiplicity of knife blocks on each module, each knife block comprising a body part having a pair of spaced apart side walls connected together by a web to define a channel on each side therof, each channel having means defining at least two spaced apart parallel pairs of aligned grooves in said side walls for receiving a knife in each pair of grooves, the spacing between adjacent pairs of grooves being equal to the intended separation of the knives, the webs being of a thickness not greater than the intended separation of the knives, said means for mounting said modules on said support includes adjusting means for effecting limited adjustment longitudinally of said knife bar support, said adjusting means comprising an open ended slot in each module and an eccentric adjusting member on said support.

4,185,569

METHOD AND APPARATUS FOR TUFTING EVEN LEVEL CUT PILE AND LOOP PILE IN THE SAME ROW OF STITCHING

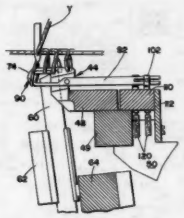
Billy E. Inman, Chattanooga, Tenn., assignor to Spencer Wright Industries, Inc., Chattanooga, Tenn.

Filed Jan. 29, 1979, Ser. No. 7,386

Int. Cl.[2] D05C *15/00*

U.S. Cl. 112—79 R **22 Claims**

1. In a tufting machine, means for feeding a base fabric in one direction, a yarn-carrying needle for penetrating the base fabric and forming loops therein, means for feeding yarn to said needle, a hook disposed on the opposite side of the base fabric from said needle, said hook comprising a body portion including a blade and a loop seizing bill extending from said blade facing in a direction opposite to the direction of fabric feed, means for mounting said body portion for oscillatory movement toward and away from said needle so that said hook enters successive loops, the feeding of the fabric moving the loops toward the body portion, a knife cooperating with said blade for severing loops thereon, gate means oscillating with



the hook for selectively engagably cooperating with said hook for closing the bill to prevent the loops from being seized by the hook and for seizing the loops, and for disengaging said hook and not entering the loops to open the bill and permit loops to be seized by the hook, whereby loops seized by the hook are severed by said knife and loops seized in the gate are shed, and control means for selectively moving said gate means into and out of engagable cooperation with said hook.

4,185,570

APPARATUS FOR CONTROLLING THE EDGE OF A TUBULAR WORKPIECE

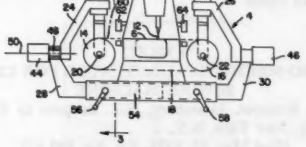
Johann O. Kleinschmidt, Karlsruhe, and Konstantin Schwaab, Aichwald, both of Fed. Rep. of Germany, assignors to Union Special Corporation G.m.b.H., Stuttgart, Fed. Rep. of Germany

Filed Jul. 5, 1978, Ser. No. 922,256

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1977, 2730291; Aug. 5, 1977, 2735282

Int. Cl.[2] D05B *21/00*

U.S. Cl. 112—121.26 **10 Claims**



1. An apparatus in combination with a sewing machine for tensioning and guiding in a predetermined manner an edge of a tubular workpiece such that it can be sewn comprising:

semi-spherical means having an axis of rotation;

frame means supporting said semi-spherical means; and

motor means associated with said frame means whereby said semi-spherical means can be rotated independently about any of three perpendicular axis.

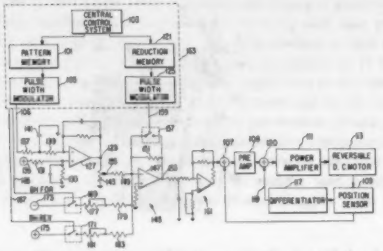
7. An elastic tensioning and supporting means in combination with a sewing machine and tubular fabric tensioning and guiding means comprising:

a series of elastic carrying means which include a means for aligning an edge of said elastic in a predetermined manner and means supporting the elastic which is retractable.

4,185,571
ANALOG ADJUSTMENT ARRANGEMENT IN A DIGITALLY CONTROLLED POSITIONING SYSTEM

Philip F. Minalga, Piscataway, N.J., assignor to The Singer Company, New York, N.Y.

Filed Jul. 28, 1978, Ser. No. 928,941
Int. Cl.[2] D05B 3/06, 3/02
U.S. Cl. 112—158 B 5 Claims



1. A sewing machine having a stitch forming instrumentality positionally controlled over a predetermined range between stitches for producing a pattern of stitches; a memory for storing pattern stitch information in digital form, wherein discrete positions of the stitch forming instrumentality are defined by digital code words stored in the memory; means operating in timed relation with the sewing machine for recovering a selected digital code word from said memory; converter means for generating a positional analog signal related to said selected digital code word; servo means responsive to said positional analog signal for positioning said stitch forming instrumentality; and means interposed between said converter means and said servo means for selectively altering said positional analog signal to proportionally alter the size of the pattern produced by the sewing machine; wherein the improvement comprises:

a signal source;

transmission means coupled at one end to the output of said converter means for varying said positional analog signal by algebraically summing therewith a signal applied to the other end of said transmission means;

controllable switch means coupled between said signal source and said transmission means and responsive to a control signal applied thereto for connecting said signal source to said other end of said transmission means; and

control means automatically operative during the sewing of a predetermined pattern for selectively generating said control signal.

4,185,572
ELECTRO-MECHANICAL ACTUATOR FOR USE IN A SEWING MACHINE

Stanley J. Ketterer, Jamesburg, N.J., assignor to The Singer Company, New York, N.Y.

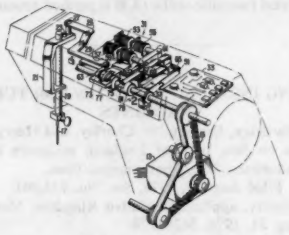
Filed Mar. 23, 1978, Ser. No. 889,325
Int. Cl.[2] D05B 3/02
U.S. Cl. 112—158 E 4 Claims

1. In a sewing machine having memory means for storing selectively retrievable stitch pattern digital information to form a selected stitch pattern and at least one stitch forming instrumentality driven by the sewing machine main drive motor and variable in position over a predetermined range of positions between successive stitches to produce said selected stitch pattern, actuator means for imparting movement to said stitch forming instrumentality in accordance with said stitch pattern information, said actuator means comprising:

a control linkage coupled to said stitch forming instrumentality;

a selectively movable position element;

adder means responsive to said pattern information for moving said position element, said adder means including a plurality of solenoids having respective movable output members and a drive lever coupled between said output members and said position element, said solenoids and said drive lever being so arranged that selective energization of said solenoids in accordance with said pattern information is translated into incremental movement of said position element;



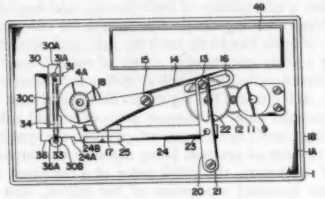
moving means driven by the main drive motor for moving said control linkage in accordance with the position of said position element; and

brake means alternately operative for preventing movement of said position element during operation of said moving means and for allowing movement of said position element during operation of said adder means.

4,185,573
SEWING MACHINE

Hajime Naito, Kofu, Japan, assignor to Crystal Sewing Machine Ind. Co., Ltd., Yamanashi Pref., Japan

Filed Nov. 17, 1977, Ser. No. 853,233
Claims priority, application Japan, Jul. 1, 1977, 52/77750; Jul. 1, 1977, 52/86202[U]
Int. Cl.[2] D05B 57/30, 61/00
U.S. Cl. 112—183 1 Claim



1. A sewing machine having a housing; a table surface on said housing; a semi-rotating looper assembly, said semi-rotating looper assembly including a rotating looper holder having inner and outer peripheral walls, a rotating looper holder opening in said table surface of said housing, a slit formed in the inner peripheral wall of said rotating looper holder, and a rotating looper disposed in said rotating looper holder and having a bobbin holding portion and an edge; a driving mechanism for causing a partial reciprocatory rotary motion of said semi-rotating looper assembly, said driving mechanism comprising a motor secured to said housing of said sewing machine, a rotary plate adapted to be rotatively driven by said motor, a projection provided at a peripheral portion of said rotary plate, a rotatable link pivoted at its one end portion to said housing, an elongated slot formed in the other end of said rotatable link and adapted to slidably receive said projection, a sector gear formed on said one end of said rotatable link, and a driving shaft for driving the rotating looper of said semirotat-

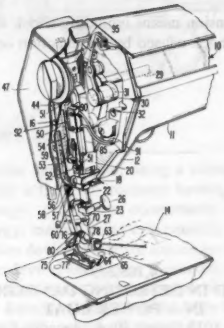
ing looper assembly, said driving shaft having a gear engaging said sector gear; and an entanglement preventing member mounted on said machine housing and having an end extending through said slit into said rotating looper holder for a resilient contact with the outer peripheral wall of said rotating looper, said outer peripheral wall conforming in shape to said edge of said rotating looper.

4,185,574

TRACK GUIDED NEEDLE THREADER SYSTEM

Peter J. Totino, New Bergen, and Robert Sedlatschek, Bridgewater, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Oct. 11, 1978, Ser. No. 950,497
Int. Cl.[2] D05B *87/02*
U.S. Cl. 112—225 **5 Claims**



1. In a sewing machine having a frame, a needle bar arranged in said frame for endwise reciprocatory motion, and a sewing needle removably attached to the end of said needle bar, said needle having a thread bearing eye, a needle threader assist comprising:

a bracket shiftably mounted on said frame for shifting between a stored position and an operative position;

a member supported by said bracket, said member having a terminus thereof formed with a conical opening for guiding thread to said needle eye;

a thread gripper pivotably supported on said terminus of said member spaced behind said conical opening to accommodate said sewing needle therebetween, said gripper having a blade portion extending adjacent said conical opening away from said terminus, whereby thread passing through said conical opening in said eye of said needle extends between said terminus and said blade and may be gripped by said gripper;

automatic means operative upon shifting of said bracket from said stored position for moving said needle to a position conducive for the threading of said needle eye; and,

positioning means acting on said bracket for aligning said conical opening with said needle eye.

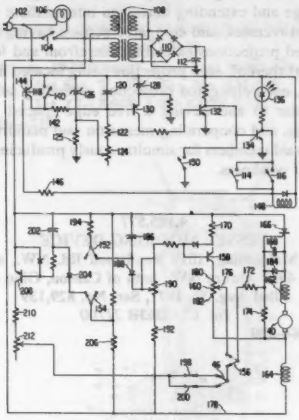
4,185,575

RAMP SPEED INTEGRATED MOTOR CONTROLLER FOR SEWING MACHINES

Jack Brown, Union; John Herr, Garwood; Wesley R. Peterson, Bound Brook, and John W. Wurst, Dover, all of N.J., assignors to The Singer Company, New York, N.Y.

Filed Feb. 28, 1979, Ser. No. 16,056
Int. Cl.[2] D05B *69/18*
U.S. Cl. 112—277 **6 Claims**

1. In a sewing machine having an electrically operable drive motor, a needle bar, an arm shaft including means for connecting said needle bar to said drive motor for endwise reciprocatory stitch forming motion of said needle bar toward and away from a stitch forming location, a contact switch disposed in close proximity to said stitch forming location and having an open position and a closed position, said contact switch being moved to said closed position by hand pressure of a sewing machine operator, and control means for connecting said drive motor to a source of electrical power in response to closure of said contact switch, said control means including operator



influenced means for setting an operating speed for said drive motor, the improvement comprising:

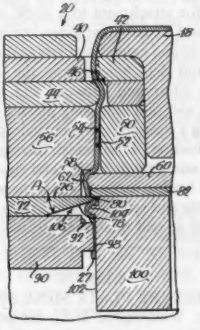
ramp speed means interposed between said source of electrical power and said control means for gradually increasing the application of electrical power to said control means for an initial power level in response to closure of said contact switch so as to control a gradual acceleration of said drive motor to said operating speed.

4,185,576

APPARATUS FOR FORMING TAMPER-PROOF CLOSURES

Robert W. George, Naperville, Ill., assignor to National Can Corporation, Chicago, Ill.

Filed Sep. 12, 1977, Ser. No. 832,176
Int. Cl.[2] B21D *51/50*
U.S. Cl. 113—1 D **9 Claims**



1. Apparatus for forming a tamper-proof metal closure having a plurality of circumferentially spaced slits separated by bridges and a plurality of lines of weakness extending perpendicular to said slits and aligned with respective bridges, comprising at least one mandrel for receiving a cup-like member, means for rotating said mandrel about its axis and simulta-

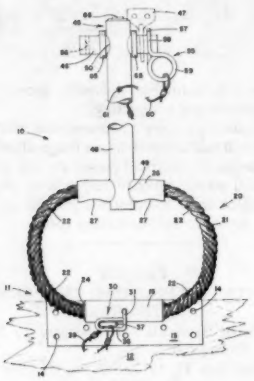
neously moving said mandrel along a path, and a stationary tool located adjacent said path, the improvement of said tool including a first integral elongated member having a free edge defining a cutting edge for producing said slits, said cutting edge having a plurality of spaced V-shaped recesses having a depth greater than the thickness of the metal closure, a second member fixed to said first member, said second member having an elongated surface generally parallel to and spaced from said cutting edge and extending across an intermediate portion of each of said recesses, said elongated surface having a plurality of elongated projections extending therefrom and forming an integral part thereof, each projection being located in a respective recess, each elongated projection extending substantially perpendicular to and having a free edge spaced from said cutting edge, and cooperating means on said mandrel cooperating with said members for simultaneously producing said slits and lines of weakness.

4,185,577

VESSEL MOORING DEVICE

Wesley C. Meinerding, 1019 Knollwood Rd. NW., and Edgar Hensley, 4957 Aurora NW., both of Canton, Ohio 44708

Filed Aug. 30, 1977, Ser. No. 829,139
Int. Cl.[2] B63B *21/00*
U.S. Cl. 114—230 **4 Claims**



1. Apparatus for mooring a vessel comprising, mounting means adapted for attachment to a dock, means for selective attachment to and detachment from the vessel, strut means rigidly attached to and extending from said means for selective attachment to and detachment from the vessel, and motion damping means interposed between and rigidly attached to said strut means and said mounting means, said motion damping means having a stranded cable providing three dimensional damping of the motion of the vessel, having first sleeve means rigidly securing said stranded cable and rigidly secured to said strut means and having second sleeve means rigidly securing said stranded cable and selectively rotatably journaled in housing means affixed to said mounting means.

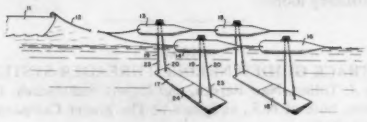
4,185,578

PRESSURE PLATE MINE SWEEP

Rufus K. Reber, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 30, 1959, Ser. No. 856,307
Int. Cl.[2] B63G *7/04*
U.S. Cl. 114—245 **19 Claims**

13. A minesweeping system comprising a pair of floats, means for towing the floats of said pair in laterally spaced relationship, a hydrofoil shaped pressure plate, and suspension means for suspending said pressure plate from said pair of



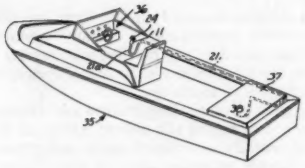
floats, said suspension means including shock absorber means for eliminating shock caused by wave action on said floats.

4,185,579

DEVICE TO AID IN DETECTING DANGEROUS FUMES IN A POWER BOAT

Nathan F. Asher, 1015 Sunset Blvd., Arcadia, Calif. 91006

Continuation-in-part of Ser. No. 759,368, Jan. 14, 1977, abandoned. This application Sep. 20, 1978, Ser. No. 943,938
Int. Cl.[2] B63J *2/06*; G01N *1/24*; F04B *43/08, 45/06*
U.S. Cl. 114—211 **3 Claims**



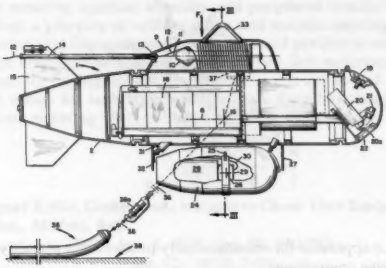
1. A device to aid a person in detecting fumes in the lower portion of an explosive fuel driven boat from a station on said boat remote from said lower portion comprising;
a manually collapsible bulb of elastomeric material at said station,
said bulb having an inlet and an outlet,
check valve means at said inlet for permitting air to pass into said bulb only,
check valve means at said outlet for permitting air to pass out of said bulb only,
an elongate inlet tube connected at one end to said inlet,
the opposite end of said tube being open and being in said lower portion of said boat,
a nose mask connected to said outlet,
means in said mask forming an orifice for restricting the outlet stream of said air whereby to increase the velocity of said stream,
said mask being adapted to fit over said person's nose whereby to orient said orifice to direct said stream towards said person's nose, and
a bracket supporting said one end of said inlet tube in fixed relation to said mask.

4,185,580

SUBMARINE SYSTEM

Jean-Claude Pujol, Rennes; Jean-Pierre Gérard, Paris; Paul Madec, Guilers, and Daniel Metaut, Brést, all of France, assignors to Etat Francais, Delegation Ministerielle pour l'Armement, Paris, France

Filed Sep. 20, 1972, Ser. No. 290,734
Claims priority, application France, Sep. 21, 1971, 71.33835
Int. Cl.[2] B63G *8/00*
U.S. Cl. 114—321 **16 Claims**



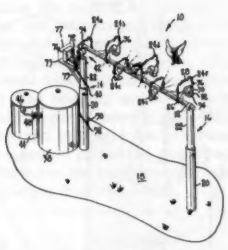
1. A submarine system comprising a submarine device for operation within a fluid environment having a self-contained source of energy, propulsion components coupled to said source of energy, maneuvering components, and an environment observation device; a control station located remote from said submarine device; and a data transmission cable connecting said submarine device with said control station said cable being of small diameter designed exclusively for data transmission purposes and being the sole link between said submarine device and said control system and being used for transmission of command signals and observation results, said device further including a transmission cable stowing compartment.

4,185,581

WEIGHT RESPONSIVE SPRAY BIRD-SCARE PERCH

Steven D. Tilton, Rte. 2, Waubun, Minn. 56589

Filed Jul. 12, 1978, Ser. No. 924,044
Int. Cl.[2] E04B *1/72*; G08B *15/02*
U.S. Cl. 116—22 A **15 Claims**



1. A bird-scare perch comprising:

perch means for supporting a plurality of birds landing on said perch means;

support means for supporting said perch means a distance above the ground;

spray means supported adjacent said perch means for directing an irritating liquid spray on birds landing on said perch means to scare the birds;

control means actuated by a preselected weight of a plurality of birds landing on the perch means for allowing a flow of liquid through said spray means when a plurality of birds have landed on said perch means, said control means including a switch means actuable by vertical movement of said perch means, and

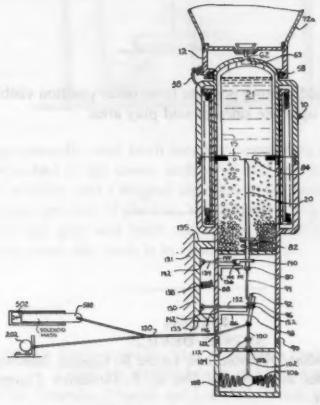
means for selectively positioning said switch means relative to said perch means for adjusting the amount of weight of birds landing on said perch means to actuate said switch means.

4,185,582

DISTRESS GAS GENERATING SIGNAL BALLOON APPARATUS

Clyde C. Bryant, 1920 Forrest Ave., East Point, Ga. 30344

Filed Sep. 7, 1977, Ser. No. 831,120
Int. Cl.[2] B64B *1/40*; G09F *9/00*
U.S. Cl. 116—210 **15 Claims**



1. A distress signal device comprising an inflatable balloon, release means connected to said balloon, said release means being removably mounted to a casing for separating from said casing when acted upon by a predetermined pressure, a tether line with one end attached to the balloon and its other end attached to said casing, a vial and a first reactant contained within said casing, said vial containing a second reactant, and activator means for breaking said vial which allows said first and second reactants to mix and generate gas within said casing, said gas building in pressure within said casing and escaping therefrom through an aperture in said casing adjacent to said release means and passing through said release means and entering and inflating said balloon through a check valve mounted on said release means, said gas building in pressure within said release means so that said release means separates from said casing when a predetermined pressure is reached, thereby allowing the balloon and said release means connected to said balloon to rise and travel away from said casing.

4,185,583

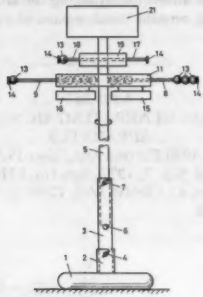
SCORE DISPLAY DEVICE

Bruno Stamm, 66 Hochstrasse, 8200 Schaffhausen, Switzerland

Filed May 22, 1978, Ser. No. 908,416
Claims priority, application Switzerland, May 24, 1977, 6405/77
Int. Cl.[2] A63B *71/06*
U.S. Cl. 116—225 **7 Claims**

1. Score display device for indicating the scores of players or teams located on opposite halves of a play area, said device being symmetrical and comprising a support, vertical pepe means extending upwardly from said support two counting devices each pointing to one of said area halves and horizontally rotatable by 180° upon change of sides, said counting

devices comprising a first pair of rods extending from said vertical pipe means and counting elements movable along said



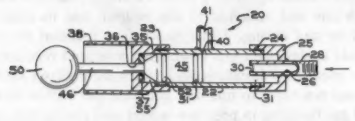
rods from a hidden inner position to an outer position visible to spectators on opposite sides of said play area.

4,185,584

SIGNAL DEVICE

Walter E. Brodine, Hudson, and Leslie B. Gajdos, Lakewood, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 18, 1978, Ser. No. 970,772
Int. Cl.[2] F16K *17/40;* **G01L** *19/12*
U.S. Cl. 116—272 **7 Claims**



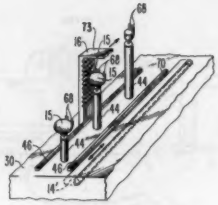
1. A signaling device for use on a reactor vessel with a rupture disc for indicating a malfunction in the rupture disc leading to a vent stack of a reactor vessel, said signaling device having a cylindrical shaped member, said cylindrical shaped member having a cap member mounted on the respective end portions thereof to define a central chamber, a conduit having one end extending through one cap member into said chamber for communicating said central chamber with said vent stack for a reactor vessel, a piston slidably received by said chamber and operative between a first and second position, said piston having a head end and a rod end, said conduit being recessed at said one end to communicate that portion of said chamber located between said head end of said piston and said one cap member to said vent stack, said piston in said first position operative to abut said one end of said conduit, a cylindrical shield connected to said other one of said cap members, a bore located in said cylindrical shaped member at the intermediate portion thereof communicating said chamber through said vent stack to atmosphere, an indicator means received by said shield and operatively connected to said rod end of said piston, said piston in said second position operative to move said indicator means out of said shield thereby interconnecting said conduit with said bore in said intermediate portion.

4,185,585

APPARATUS FOR SIMULTANEOUSLY PROCESSING A PLURALITY OF SUBSTRATES

Robert C. Shambelan, Bridgewater, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 790,197, Apr. 25, 1977, abandoned. This application Jun. 6, 1978, Ser. No. 913,240
Int. Cl.[2] B44D *1/34;* **C23F** *1/34, 1/44*
U.S. Cl. 118—50.1 **28 Claims**



1. An apparatus for simultaneously processing a plurality of substrates comprising:

a plurality of substrate spindles affixed to a floor of a processing chamber, each said spindle having a substrate receiving surface each of which is at a different height from said floor than every other said substrate receiving surface;

means for delivering a plurality of substrates to said spindles;

means associated with each said spindle for disengaging one of said substrates from said delivering means when said delivering means is passed over said spindle; and

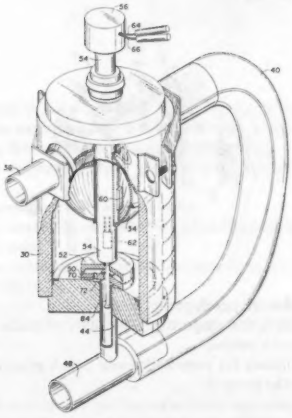
means for dispensing processing material into said chamber.

4,185,586

MILK SENSOR FOR MACHINE REMOVER

Andrew J. Flocchini, 7050 Lakeville Hwy., Petaluma, Calif. 94952

Filed Oct. 31, 1977, Ser. No. 847,290
Int. Cl.[2] A01J *5/04*
U.S. Cl. 119—14.08 **3 Claims**



1. A flow sensing device comprising: a chamber having a floor with a drain therein, an upper portion, and a lower portion; an input conduit communicated to said upper portion; an outflow conduit communicated to said drain; an overflow conduit communicating said upper portion to said outflow

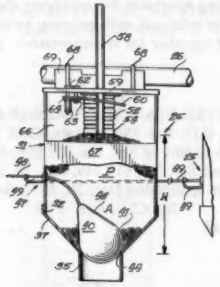
conduit; means to sense the level of liquid in said chamber; a first metering disc overlying said drain, said first metering disc having upper and lower surfaces and a metering aperture between said surfaces of said first metering disc for defining the flow of liquid to said drain; a second metering disc overlying said first metering disc, said second metering disc having a lower surface, means for defining a peripheral annular extending ridge surrounding said lower surface of said second metering disc when said second disc is confronted to said upper surface of said first metering disc, said defined ridge having a plurality of notches therein, said notches being smaller than said metering aperture whereby said peripheral annular ridge defines a plurality of orifices when said second metering disc overlies said first metering disc so that said peripheral annular ridge confronts said upper surface of said first metering disc; means for raising said first metering disc relative to said floor; and means for separating said metering discs by raising said second metering disc relative to said first metering disc.

4,185,587

HOG FEEDER

Ingmar Kallin, Goshen, Ind., assignor to Chore-Time Equipment, Inc., Milford, Ind.

Filed Apr. 6, 1978, Ser. No. 893,883
Int. Cl.[2] A01K 5/02
U.S. Cl. 119—51.11 **17 Claims**



1. A feeder for livestock and the like, comprising, in combination, feed receiver body means for receiving and storing a flow of feed, boot means extending from the receiver means and defining a discharge opening, stopper valve means carried in the boot means, the stopper valve means including a pear-shaped member, the pear-shaped member having a substantially semi-spheroidal bottom element adapted to fit within and upon the boot discharge opening and a conical top element adapted to prevent feed from collecting upon the stopper top and to disturb feed bridging action within the receiver and dispenser as the stopper member is pulled away from the discharge opening, and stopper actuator means attached to the stopper valve means to permit the stopper valve means to be pulled away from the discharge opening, thereby permitting feed discharge action from the feeder.

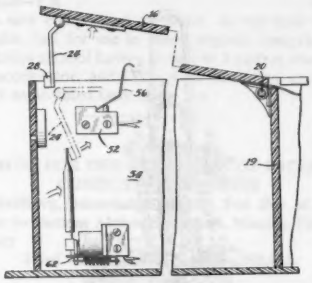
4,185,588

PET FEEDING APPARATUS

Joseph R. Harris, 3711 S. King Dr., Chicago, Ill. 60653

Filed Jan. 11, 1978, Ser. No. 868,666
Int. Cl.[2] A01K 5/00
U.S. Cl. 119—51.12 **8 Claims**

1. A pet feeding apparatus which comprises a box enclosing a feeding space, said box carrying openable and closable door means to provide access to said feeding space within the box, said door means being springbiased to be normally retained in the open position, a latch member for retaining the springbiased door means in the closed position, and timer controlled means which may be set to release the latch member, to permit the door means to open at a preset time, exposing the feeding space, said box being attached to an enlarged, flat generally rigid platform of length and width larger than said box, whereby a pet eating food from the feeding space normally stands on the platform, and thus cannot accidentally tip or move said box while feeding, in which said door means is defined in the upper surface of said box, and is adapted to



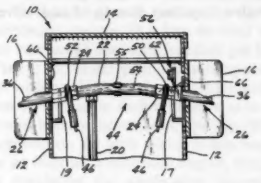
swing upwardly, said latch member comprising a hinge member attached to the lower surface of said upwardly swinging door member, and a magnet attached to the inner surface of a stationary portion of the box, said magnet being positioned to attract and grip said latch member in interlocking, latching relation when the latch is in closed position.

4,185,589

METHOD AND APPARATUS FOR HEATING A NIPPLE VALVE LIVESTOCK WATERER

Jerry D. Peterson, Conrad, and Gerald L. Knief, Grundy Center, both of Iowa, assignors to Ritchie Industries, Inc., Conrad, Iowa

Filed Dec. 15, 1976, Ser. No. 750,834
Int. Cl.[2] A01K 7/00, 7/06
U.S. Cl. 119—73 **11 Claims**



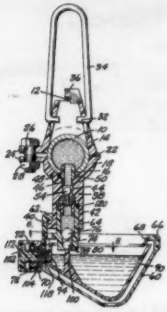
6. A nipple valve heating apparatus comprising: a heat sink coupling fluidly connected at one end to a nipple valve and fluidly connected at the opposite end to a water supply line, said coupling and said valve in heat conductive relationship; an electrical heater adapted to be connected to an electrical power source and including at least one arcuate portion contacting a circumferential section of said coupling for transferring heat from the heater to the coupling and from the coupling to the valve; and temperature activated control means adapted to be connected to the power source and adapted to sense the temperature of said coupling, said temperature activated control means including a heat conducting support bracket having a bifurcated end in contact with and frictionally engaging the outer surface of said coupling, and including an upwardly extending mounting plate, and a thermostat mounted on said mounting plate for controlling the supply of electrical power to said heater.

4,185,590

WATERING CUP FOR POULTRY AND ANIMALS

Eldon Hostetler, Middlebury, Ind., assignor to Ziggity Systems, Inc., Middlebury, Ind.

Filed Sep. 26, 1977, Ser. No. 836,386
Int. Cl.[2] A01K *7/02*
U.S. Cl. 119—81 **8 Claims**



1. A watering cup adapted for connection with a water supply line at a valved discharge outlet, comprising

a cup housing releasably anchored to said outlet in a position to open the valve thereof,

means sealing the connection of said housing and discharge outlet,

a water cup pivoted within said housing for limited vertical pivoted movement,

a normally closed valve carried by said housing,

actuator means carried by said cup for opening said valve to control the supply of water to said cup,

cup positioning means carried by said housing including a spring normally urging said cup to a filling position wherein said actuator means on said cup actuates said valve to open position

said cup being of a size to receive a quantity of water sufficient to overcome the force of said spring and swing said cup to a position disengaging said actuator means from said valve to permit closing of said valve.

4,185,591

TRANSPORT AND RECOVERY BED FOR HORSES

James Patelis, 7 Ruth Dr., Hicksville, N.Y. 11801

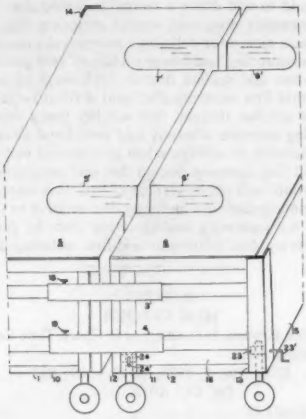
Filed Aug. 9, 1978, Ser. No. 932,280
Int. Cl.[2] A61D *3/00*
U.S. Cl. 119—98 **9 Claims**

1. Stretcher means for horses comprising:

a split cart having first and second half cart portions each portion having wheels,

means mounted on the first portion and adapted to be connected to lock the split cart together,

a split resilient bed mounted in said cart,



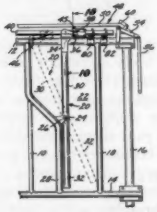
said bed having apertures for receiving the legs of a horse whereby the split cart with bed may be slid under a horse, and locked together for transportation.

4,185,592

CATTLE STANCHION APPARATUS

Teo Albers, Sr., P.O. Box 156, Artesia, Calif. 90701

Continuation-in-part of Ser. No. 827,090, Aug. 19, 1977, abandoned, and Ser. No. 613,169, Sep. 15, 1975, Pat. No. 4,051,813. This application Dec. 30, 1977, Ser. No. 866,029
Int. Cl.[2] A01K *1/08*
U.S. Cl. 119—148 **15 Claims**



1. In cattle stanchion apparatus including a fixed stanchion; a release stanchion located adjacent and spaced from said fixed stanchion to define a head opening for an animal; and mounting means mounting said release stanchion for pivotal movement between open positions, in which the upper part of said head opening is enlarged to enable an animal to place its head through said head opening, and a closed position in which said head opening is narrowed to hold the animal's head in said head opening, the improvement comprising:

a generally horizontally elongated rail means overlying said release stanchion;

a bracket means carried at the upper extremity of said release stanchion;

release means including a generally horizontally elongated release member and handle means operative to move said release member between a locking position, a first release position, and a second release position, and having a detent; and

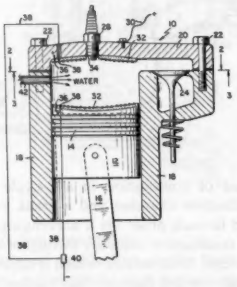
a coupling element pivotally carried by said bracket means, movable along said release member upon pivotal movement of said release stanchion, and having a coupling portion releasably coupleable with said detent for movement with said release member to said first release position to thereby locate said release stanchion in an open position, and whereby said coupling element is movable with said release member upon movement of said release member from said first release position to said locking position, said coupling element further having a decoupling portion engageable with said rail means in said second release position of said release member, whereby said coupling portion can be decoupled from said detent of said release member when said release member is in said second release position to thereby enable movement of said release member to said locking position independently of said coupling element, and whereby subsequent movement of said release stanchion to its closed position by an animal is operative to move said coupling element and recouple said coupling portion and said detent to lock the animal in position.

4,185,593

TRANSFORMATION OF ELECTRICAL ENERGY TO PHYSICAL ENERGY

Kenneth S. McClure, Rte. 1, Thayer, Kans. 66776

Filed Oct. 31, 1977, Ser. No. 571,975
Int. Cl.² F02B *43/08*
U.S. Cl. 123—1 A **13 Claims**



1. A process for providing for the removal of hydrogen from a catalytic cathode means whereby the hydrogen may be recombined with oxygen to provide explosive force to power an internal combustion engine which comprises:

(a) spraying water into a combustion chamber of an engine at a temperature below about 100° C. and a pressure below about 14.7 psia, a combustion chamber containing a catalytic cathode means and a catalytic anode means spacedly juxtaposed thereto, insulation means positioned between said catalytic cathode means and said catalytic anode means, said cathode means and said anode means being electrified, said water bridging the space between said cathode means and said anode means such that electrolytic decomposition of the water is initiated by said electrification;

(b) forming a hydrogen surface film and interstitial hydrogen in and on said catalytic cathode means by said cathode means and said anode means being electrified and associated with said water; and

(c) purging said hydrogen surface film on said cathode means and said interstitial hydrogen dissolved in said cathode means by raising the temperature of said cathode means to above about 250° C., said purging being in the form of expelled molecular hydrogen which mixes with said available oxygen.

4,185,594

DIESEL FUEL COMPOSITIONS HAVING ANTI-WEAR PROPERTIES

Warren L. Perilstein, Orchard Lake, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 18, 1978, Ser. No. 970,753
Int. Cl.² C10L *1/18*
U.S. Cl. 123—1 A **24 Claims**

1. As a new composition of matter, an anti-wear compression ignition fuel for use in diesel engines comprising (1) a monohydroxy alkanol having from 1 to 5 carbon atoms, (2) an ignition accelerator, and (3) a wear inhibiting amount of a dimerized unsaturated fatty acid.

4,185,595

METHOD FOR THE OPERATION OF INTERNAL COMBUSTION ENGINES

Erhard Muhlberg, Darmstadt-Eberstadt, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 24, 1972, Ser. No. 283,412
Int. Cl.² F02B *43/08*
U.S. Cl. 123—3 **15 Claims**

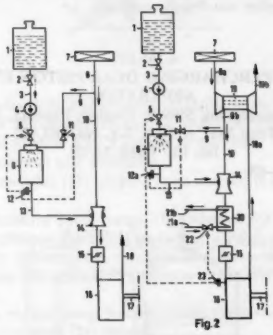


Fig. 2

1. In a method for the operation of internal combustion engines with reduced emission of harmful substances in the exhaust gas, wherein liquid fuel and gasification air are conducted into a gasification reactor at a low air/fuel ratio and mixed, the mixture converted into soot-free fuel gas by partial oxidation of the fuel at increased gasification temperature, the fuel gas leaned out with combustion air, so that the fuel gas and combustion air can be burned in such a manner as to produce an exhaust gas low in harmful substances, and the the mixture of fuel gas and combustion air with which it has been leaned out then burned in an internal combustion engine, the improvement comprising regulating the gasification temperature in dependence on the load and the speed of the internal combustion engine in such a way, that a low gasification temperature is maintained at full load and is increased at decreasing load.

4,185,596

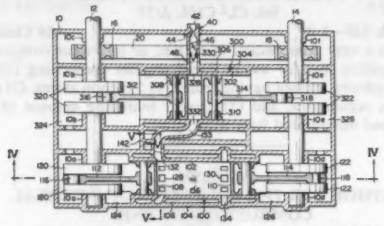
TWO-STROKE CYCLE GASOLINE ENGINE

Masaaki Noguchi, Nagoya; Yukiyasu Tanaka, and Isao Igarashi, both of Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 20, 1978, Ser. No. 917,241
Claims priority, application Japan, Apr. 28, 1978, 53-52105
Int. Cl.² F02B *25/08*
U.S. Cl. 123—51 B **9 Claims**

1. A two-stroke cycle gasoline engine comprising at least one two-stroke cycle power cylinder-piston assembly incorporating uniflow scavenging and two horizontally opposed pistons, at least one scavenging pump cylinder-piston assembly of the reciprocating type and driven by said power cylinder-piston assembly in synchronization therewith with a phase differ-

ence, wherein the total stroke volume of said pump cylinder-piston assembly is between 1.15 and 1.65 times as large as that of said power cylinder-piston assembly, and said phase difference between said power and pump cylinder-piston assemblies is so determined that the top dead center of a pump cylinder-



piston assembly is, as viewed in the crank angle diagram, in a range between 15° in advance of and 15° behind the midpoint between the bottom dead center and the scavenging port closing phase point of the power cylinder-piston assembly to which is supplied scavenging mixture.

4,185,597

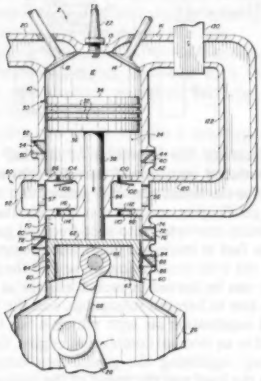
SELF-SUPERCHARGING DUAL PISTON ENGINE APPARATUS

Vincent J. Cinquegrani, 5409 E. Pinchot, Phoenix, Ariz. 85018

Filed Mar. 6, 1978, Ser. No. 883,657

Int. Cl.[2] F02B *33/00*

U.S. Cl. 123—68 **25 Claims**



1. Dual piston self-supercharging internal combustion engine apparatus comprising, in combination:

cylinder means;

a cylinder head secured to the cylinder means;

piston means including a first piston in the cylinder means and a second piston in the cylinder means connected to and moving with the first piston;

a combustion chamber in the cylinder means between the cylinder head and the first piston;

a bulkhead disposed between the first and second pistons;

supercharger chamber means in the cylinder means adjacent the bulkhead means;

a plurality of intake ports extending through the cylinder means and separated from each other axially and communicating with the supercharger chamber means for providing a flow of air into the supercharger means in response to movement of the piston means;

a plurality of reed type check valves for controlling the flow of air into the supercharger chamber means through the plurality of axially separated intake ports;

transfer manifold means extending from the bulkhead to the combustion chamber for transferring air from the supercharger chamber means to the combustion chamber;

aperture means in the bulkhead communicating between the supercharger chamber means and the transfer manifold means; and

reed type check valve means for controlling the flow of air from the supercharger chamber means into the transfer manifold means through the aperture means.

4,185,598

INTERNAL COMBUSTION ENGINE

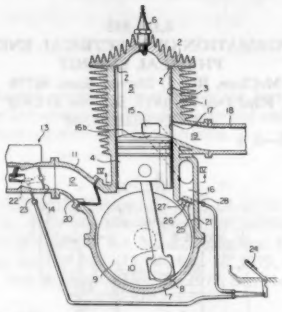
Shigeru Onishi, Kanazawa, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Aug. 19, 1977, Ser. No. 826,123

Claims priority, application Japan, Aug. 25, 1976, 51-101899; Dec. 29, 1976, 51-158047

Int. Cl.[2] F02B *33/04*

U.S. Cl. 123—73 A **18 Claims**



1. A method of combustion in a 2-cycle engine having therein a combustion chamber and a crank room which are interconnected to each other via a scavenging passage which opens into the combustion chamber through a scavenging port having a transverse cross-section which is approximately equal to that of the scavenging passage, said method comprising the steps of:

feeding a fresh combustible fuel mixture into said crank room;

compressing the fresh combustible fuel mixture in said crank room;

leading the fresh combustible fuel mixture in said crank room into said scavenging passage;

restricting the velocity of the flows of the fresh combustible fuel mixture flowing in said scavenging passage in a region thereof close to said crank room when the engine is operating under a partial load;

feeding the fresh combustible mixture at a slower velocity, relative to that entering the passage, from the scavenging passage into said combustion chamber; and

discharging exhaust gas in said combustion chamber into the atmosphere.

8. A 2-cycle internal combustion engine comprising:

a cylinder block having a cylinder bore and a crank room therein;

a piston having an approximately flat top surface and reciprocably movable in said cylinder bore, said piston and said cylinder bore defining a combustion chamber;

a scavenging passage having a scavenging port at one end thereof which opens into said combustion chamber and fluidly communicating said combustion chamber with said crank room at the other end thereof for feeding a fresh combustible fuel mixture into said combustion chamber,

said scavenging port having a transverse cross section which is approximately equal to that of the scavenging passage;

an exhaust passage having an exhaust port opening into said combustion chamber for discharging burned gas from said combustion chamber into the atmosphere; and

restricting means in said scavenging passage adjacent the other end thereof where said scavenging passage opens into said crank room for restricting the velocity of the fresh combustible fuel mixture fed into said combustion chamber when the engine is operating under a partial load and for creating an active thermoatmosphere in said combustion chamber to cause self-ignition of the active thermoatmosphere.

4,185,599

CONTROL SYSTEM FOR VARYING THE AMOUNT OF SCAVENGING AIR TO BE ADMITTED TO INTERNAL COMBUSTION ENGINE

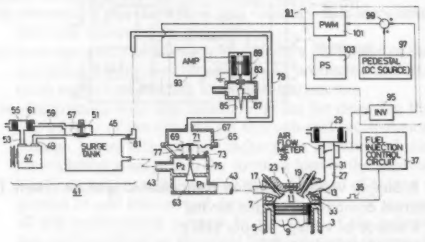
Michio Onoda, Yokohama; Yasuo Nakajima, Yokosuka; Kunihiko Sugihara, and Shin-ichi Nagumo, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 6, 1978, Ser. No. 867,620

Claims priority, application Japan, Jan. 8, 1977, 52-966

Int. Cl.[2] F02D *39/02;* **F02B** *33/00*

U.S. Cl. 123—75 B **13 Claims**



1. An engine system comprising:

a four-cycle internal combustion engine having a combustion chamber, a first intake port passage opening to said combustion chamber, an exhaust port passage opening to said combustion chamber, a second intake port passage opening to said combustion chamber, a first intake valve closing said first intake port passage and adapted to be opened to perform an intake cycle, an exhaust valve closing said exhaust port passage and adapted to be opened to perform an exhaust cycle, and a second intake valve closing said second intake port passage and adapted to be opened during a period overlapping said exhaust cycle and the subsequent intake cycle;

an induction passageway connecting with said first intake port passage;

a source of compressed air having a constant pressure;

an injection passageway connecting said source of compressed air to said second intake port passage;

a flow control valve fluidly disposed in said injection passageway; and

control means whereby said flow control valve will vary effective flow area of said injection passageway in response to the flow rate of fluid passing through said induction passageway;

said control means comprising

sensor means for generating a first pressure signal indicative of the flow rate of fluid passing through said induction passageway;

means for generating a second pressure signal which is an amplified one of said first pressure signal; and

motor means for actuating said flow control valve in response to said second pressure signal.

4,185,600

REPLACEMENT UNIT FOR CONTACTLESS IGNITION CONTROL IN INTERNAL COMBUSTION ENGINES

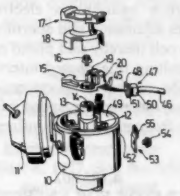
Hartmut Brammer, Schwieberdingen; Helmut Jooss, Ditzingen; Harry Kaiser, Hochdorf, and Gerhard Schellenberg, Fellbach, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 27, 1978, Ser. No. 890,195

Claims priority, application United Kingdom, Apr. 14, 1977, 2716510

Int. Cl.[2] F02P *1/00*

U.S. Cl. 123—146.5 A **18 Claims**



1. In a contactless ignition control replacement unit for the distributor of an internal combustion engine having a distributor shaft (24) formed with a keying recess (14),

said replacement unit including

a support member (15) adapted to be secured in said distributor,

and a distributor rotor means (17) adapted for assembly to the distributor shaft (24) including a rotor element (18) variably affecting the magnetic flux between said magnetic unit (19) and a Hall generator as the rotor means (17) rotates,

said rotor means being formed with a recess to receive the distributor shaft (24) therein;

a high strength cap-shape reinforcing member (25) anchored in said recess of the distributor rotor means, said member having a keying projection (26) fitting into the keying recess (14) of the distributor shaft, and a sleeve (29) extending over the region surrounding said keying projection (26).

4,185,601

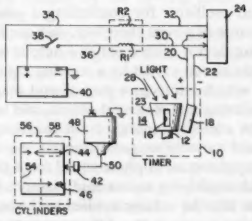
PHOTO ELECTRIC IGNITION SYSTEM

Louis Forde; Alonzo C. Forde; Gregory L. Forde; Alfredo Forde, and Raymond Forde, all of 482 Berriman St., Brooklyn, N.Y. 11208

Filed Feb. 22, 1978, Ser. No. 880,205

Int. Cl.[2] F02P *1/00*

U.S. Cl. 123—146.5 A **7 Claims**



1. An ignition system for a multi-cylinder internal combustion engine comprising in combination;

a timing housing means including an orifice on the upper surface admitting light beams emanating from a radiant energy source,

a driving shaft in said timing housing,

a cone shaped rotor member means mounted on said driving shaft and rotated within said housing; means including said shaft for displacing said rotor member means in synchronism with the engine rotations, said rotor member means including an open end chamber being rotated adjacent said orifice in said housing admitting beams from said energy source thereinto; and a plurality of apertures therein as there are cylinders in the engine and being spaced apart at equal angles such that there exists a fixed relationship with each other, said apertures extending into said chamber, wherein said apertures on said rotor member means operate a photo electric cell means allowing focusing thereon causing an electrical emission, and wherein spaces separating said apertures prevent focusing on said photo cell thereby said photo cell does not electrically emit resulting in a phased interval influence signal and wherein the number of aperatures on said rotor member means and the rotating speed of said driving shaft determine the frequency of said influence signal.

4,185,602

PULSE GENERATOR FOR ENERGY DISCHARGE SYSTEM

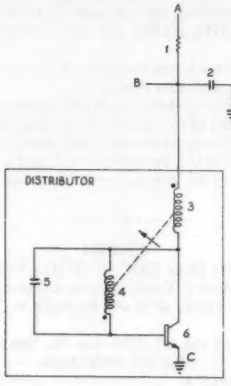
Floyd M. Minks, Rte. 1, Box 66, Kissimmee, Fla. 32741, and Floyd A. Minks, Box 252, Ridgetop, Tenn. 37152

Division of Ser. No. 416,392, Apr. 16, 1972, Pat. No. 4,100,906. This application Mar. 30, 1978, Ser. No. 891,832

The portion of the term of this patent subsequent to Jul. 18, 1995, has been disclaimed.

Int. Cl.[2] F02P *5/04, 1/00;* **H05B** *41/14*

U.S. Cl. 123—148 E **20 Claims**



1. A gated oscillator for controlling a solid state ignition system, a source of power therefore, said oscillator containing an amplifying device with input and output terminals, a variable magnetic circuit varied by a rotating conductive member portions of which interrupt a part of said magnetic circuit, a winding enclosing said magnetic circuit, said winding containing all turns coupling energy from said amplifying device output to said variable magnetic circuit, a positive feedback means for supplying an in-phase signal from the output to the input of said amplifying means said positive feedback means connected so that the voltage applied to the input terminals of said amplifying means is the difference between the voltage across said winding and said positive feedback means, so that the voltage across said winding will be effective as negative feedback, such that said oscillator is gated at pre-determined positions of said rotating member where output pulses from said ignition system are required.

4,185,603

SUPPLY VOLTAGE VARIATION COMPENSATED IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

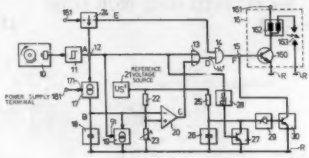
Gerhard Söhner, Geradstetten; Gerd Höhne, Ludwigsburg; Peter Werner, Stuttgart; Ingo Gorille, and Herman Roozenbeek, both of Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 29, 1977, Ser. No. 865,578

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1977, 2700677

Int. Cl.[2] F02P *3/04*

U.S. Cl. 123—148 E **15 Claims**



1. Supply voltage variation compensated ignition system for internal combustion engine having

a source of voltage supply (**161**);

an ignition coil (**162**);

a control switch (**160**) in series with the primary of the ignition coil (**162**), and, selectively connecting and disconnecting current flow through the primary of the ignition coil from said source of supply voltage;

means (**10, 11**) controlling opening and closing, selectively, of said control switch (**160**) in dependence of rotation on the shaft of the engine;

and comprising, in accordance with the invention

at least one timing circuit (**17, 18, 19, 20; 24; 17', 18', 19',22,23,25**) including

a capacitor (**18**),

a capacitor charge circuit (**17**) and a capacitor discharge circuit (**19**) for said capacitor, at least one of said capacitor circuits being controllable,

and a comparator circuit having the voltage appearing at said capacitor (**18**) applied to one comparison input thereof, the other comparison input being connected to a source (**21, 161**) of threshold voltage (U_s), the output of said comparator (**20**) being connected to said control switch (**160**) to provide a signal therefore controlling closing of said switch,

said timing circuits being connected to the source of voltage supply (**161**) and establishing at least one timing interval additionally controlling the closed time of said control switch (**160**) as a function of said at least one timing interval to control the commencement of current flow through said controlled switch, after a preceding interruption thereof, in dependence on the level of the voltage of said supply source (**161**) with respect to said source (**21**) of threshold voltage.

4,185,604

FEEDBACK CONTROL SYSTEM FOR GAS FLOW IN INTERNAL COMBUSTION ENGINE FOR PURPOSE OF EXHAUST GAS PURIFICATION

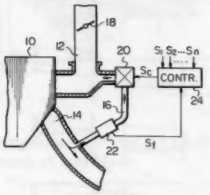
Hatsuo Nagaishi; Suzuo Suzuki, both of Yokosuka, and Yuji Matsubara, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 15, 1978, Ser. No. 886,819

Claims priority, application Japan, Apr. 12, 1977, 52/40901; Apr. 12, 1977, 52/40902

Int. Cl.[2] F02M *25/06*; F01N *3/10*

U.S. Cl. 123—119 A **24 Claims**



2. A feedback control system for controlling the recirculation of a portion of the exhaust gas of an internal combustion engine through an exhaust gas recirculation passage interconnecting an exhaust passage and an induction passage of the engine, the control system comprising:

an electrically operated flow rate control valve associated with said recirculation passage;

at least one sensor means each for sensing a parameter of the operating condition of the engine and producing an electrical signal representing the sensed parameter;

an electrostatic flow rate detection means for detecting the rate of flow of the exhaust gas through said recirculation passage, by making corona discharge in a section of said recirculation passage thereby forming ions in the recirculated exhaust gas and detecting the movement of at least a portion of said ions carried downstream from said section of said recirculation passage by the flow of the exhaust gas, and providing an electrical feedback signal representing the detected flow rate; and

a control means for finding an optimum flow rate of the exhaust gas through said recirculation passage under an operating condition of the engine indicated by the signal or signals provided by said at least one sensor means, detecting any deviation of an actual flow rate represented by said feedback signal from said optimum flow rate and supplying to said flow control valve a control signal effective for cancellation of the detected deviation and establishment of said optimum rate.

4,185,605

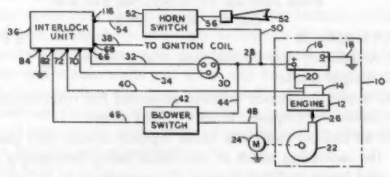
ENGINE STARTER AND BLOWER INTERLOCK SYSTEM

Donald A. Largent, Sr., Rte. 3, Box 412, Escondido, Calif. 92025

Filed May 18, 1978, Ser. No. 907,171

Int. Cl.[2] F02N *17/00*; B63J *2/00*; B60L *1/00*

U.S. Cl. 123—179 B **7 Claims**



1. An engine ventilating and starting control system, comprising in combination:

a source of electrical power,

a starting motor for starting an engine,

a ventilating blower motor for powering

circuit means for selectively connecting said source of power to said blower motor and said starter motor, said circuit means including first time delay means preventing connection of said power source to said starting motor until said blower motor has been connected to said source for a first predetermined period of time,

means for bypassing said first time delay means for establishing a second predetermined period of time shorter than said first predetermined period of time during which connection of said power source to said starting motor is prevented,

said means for bypassing said first time delay means includes a horn circuit that simultaneously activates an alternate timing circuit upon continuous activation of the horn circuit for said second predetermined period of time.

4,185,606

DECOMPRESSION OPERATIVELY CONNECTED TYPE KICK-STARTING DEVICE

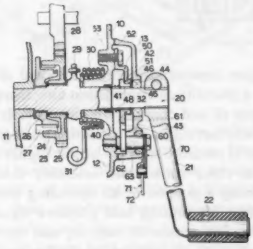
Takahide Miyata, Kawagoe, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1977, Ser. No. 858,564

Claims priority, application Japan, Dec. 13, 1976, 51/166948[U]

Int. Cl.[2] F01L *13/08*

U.S. Cl. 123—182 **9 Claims**



1. A decompression operatively connected kick-starter device comprising:

kick-starter means including a kick-starter spindle, a starter arm, and a starter pedal;

a decompression mechanism;

a cam operatively and mechanically connected to said kick-starter spindle;

said cam having at least two cam parts, one of which is a large diameter part for a decompression operation, and the other of which is a small diameter part for resetting operation;

said cam being rotated by the driving force of said kick-starter spindle;

a cam follower guided by said large diameter part of said cam rotated by a kicking operation at the time of starting and operating said decompression mechanism;

whereby a decompression operation is made in response to engagement of said cam follower with said large diameter part of said cam only within the range of a fixed angle of rotation of said kick-starter spindle;

said cam being provided integrally with said two-step cam parts of said large diameter part for said decompression operation and said small diameter part for said resetting operation;

said cam being slidable in an axial direction with respect to said kick-starter spindle, and being resiliently pressed in one direction in said axial direction;

said decompression mechanism including an exhaust valve or a decompression valve; and

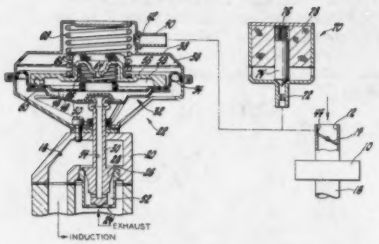
said cam follower being engaged and always resiliently pressed in contact with said cam, whereby said decompression operation is made by the engagement of said cam follower with said large diameter part of said cam only in the range of a fixed angle of rotation of the kick-starting operation.

4,185,607

DUAL DISPLACEMENT ENGINE CONTROL

William F. Thornburgh, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 5, 1978, Ser. No. 912,944
Int. Cl.[2] F02D *13/06*; F02M *25/06*
U.S. Cl. 123—198 F **6 Claims**



1. An engine control assembly for a dual displacement engine having a plurality of combustion chambers and means for disabling some of said combustion chambers at selected times, said engine also having an air induction passage that creates a subatmospheric pressure signal which is higher at said selected times than at other times, said assembly comprising a diaphragm defining a portion of an operating pressure chamber having a fitting for sensing said pressure signal to create an operating pressure, means for varying said operating pressure in accordance with an engine operating condition, and an engine control element positioned by said diaphragm in accordance with said operating pressure, and wherein the improvment comprises a port opening from the atmospheric to said fitting for increasing said subatmospheric pressure signal, and means for obstructing flow through said port at said selected times, whereby said fitting senses similar pressures and said diaphragm positions said control element in a similar manner both at said selected times and at said other times.

4. The method of controlling an engine control element in a dual displacement engine having a plurality of combustion chambers and means for disabling some of said chambers at selected times, said engine also having an air induction passage that creates a subatmospheric pressure signal which is higher at said selected times than at other times, said method comprising the steps of

creating a subatmospheric operating pressure by sensing said pressure signal,

varying said operating pressure in accordance with an engine operating condition,

positioning said control element in accordance with said operating pressure,

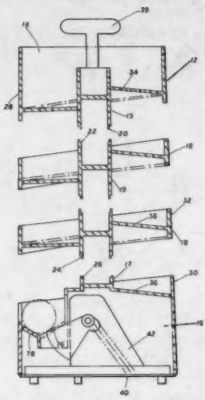
and increasing said subatmospheric pressure signal at said other times to create an operating pressure similar to the operating pressure created at said selected times whereby said control element is positioned in a similar manner both at said selected times and at said other times.

4,185,608

SPRING TYPE BALL PROJECTING DEVICE

Ray A. Young, and Craig A. Young, both of Geneva, N.Y., assignors to Omnitec Products Corporation, Chagrin Falls, Ohio

Filed Aug. 27, 1975, Ser. No. 608,187
Int. Cl.[2] F41B *7/00*
U.S. Cl. 124—16 **2 Claims**



1. In a portable ball propelling apparatus, a frame including a molded plastic housing forming a helical ball storage and supply path ending in a ball stop positioning station, a ball hammer means, a driven shaft on which said hammer means is journalled, connector clutch means between said shaft and said ball hammer means to move said hammer means in only one direction, said hammer means being rotatably positioned to move to and through a portion of the volume of a ball in said helical pathat said stop positioning station, spring means on said frame directly and operably engaged by said hammer means and frame to be tensioned by rotary movement of said hammer means in one direction to advance it rapidly as such hammer means is moved over a dead center position for ball striking action, and

said housing is made from a plurality of sections including interengaging tubular center portions on each of said sections that secure the sections together; top, bottom, and two center sections are provided and said two center sections are identical; and said sections all include floor and outer wall portions smoothly connecting to each other to form a helical ball storage and supply device.

4,185,609

BAND TYPE LAPIDARY SAW

Frank Petera, P.O. Box 695, Sundance, Wyo. 82729

Filed Jun. 23, 1978, Ser. No. 918,676
Int. Cl.[2] B28D *1/08*
U.S. Cl. 125—21 **5 Claims**

1. A lapidary saw for slabbing rocks comprising:

(a) a rigid frame;

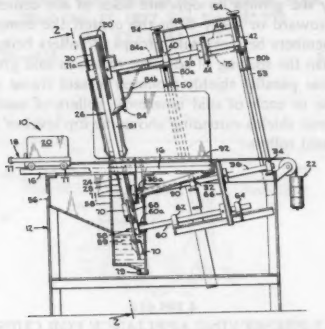
(b) upper and lower sheaves mounted for rotation on said frame and disposed in an inclined plane;

(c) an endless band saw blade trained around said sheaves, the ascending reach of said blade being the cutting reach and being inclined toward the workpiece to be cut;

(d) a slurry tank disposed below said lower sheave; and

(e) a driven paddle wheel mounted beneath said lower

sheave and having its lower sector disposed within the contents of said slurry tank for agitating the slurry to



maintain a suspension state and for casting slurry onto the ascending reach of said blade.

4,185,610

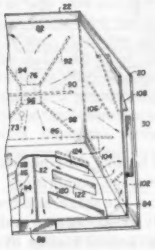
FORCED AIR CHANNEL BAFFLES

Carrol E. Buckner, Weaverville, N.C., assignor to Smoky Mountain Enterprises, Inc., Asheville, N.C.

Continuation-in-part of Ser. No. 693,805, Jun. 7, 1976, Pat. No. 4,092,976. This application Aug. 26, 1977, Ser. No. 828,206

Int. Cl.[2] F24C *1/14*

U.S. Cl. 126—121 **16 Claims**



1. A fireplace comprising:

a chamber for holding a source of heat;

a forced air channel surrounding a back wall, side walls and a bottom wall of said chamber, said channel including substantially the entire back wall, said two side walls and said bottom wall of said chamber;

the back portion of said forced air channel communicates with the two side and bottom portions of said forced air channel and said bottom portion communicates with said two side portions;

a vent means in the front of said forced air channel;

means for forcibly introducing air into said back portion of said air channel and over substantially the entire surface of said back wall of said chamber; and

baffle means interior said back, two side and bottom portions of said channel for directing forced air from said back portion to said two side portions, and over substantially the entire side walls and from said back portion to said bottom portion and over substantially the entire bottom wall and from the bottom portion to said side portions to said vent means in the front of said forced air channel.

9. A heating unit comprising:

a fire box;

forced air channels along a back, bottom and two side walls of said fire box;

an inlet in the back wall portion of said forced air channel and outlets in the side wall portions;

means for forcing air from said inlet to said outlet through said forced air channel;

first baffle means in said back wall portion for radially directing the forced air from said inlet over said back wall of said fire box;

second baffle means in said side wall portions for directing the forced air to said outlet from said back wall portion over the side wall of said fire box; and

third baffle means in said bottom wall portion including two sets of baffles on each side of the center of said bottom portion, the baffles in a set are substantially parallel to each other and the ends of said baffles adjacent said center are staggered relative to said center.

4,185,611

FIREPLACE HEATING UNIT

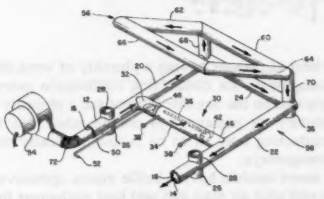
John Johnson, 3695 Hunter St., Glen Avon, Calif. 92509

Continuation-in-part of Ser. No. 713,888, Aug. 12, 1976, Pat. No. 4,088,114. This application Mar. 24, 1978, Ser. No. 889,754

The portion of the term of this patent subsequent to May 9, 1995, has been disclaimed.

Int. Cl.[2] F24B *7/00*

U.S. Cl. 126—121 **22 Claims**



1. A fireplace heater, comprising:

a first plurality of interconnecting, hollow, tubular, air-conducting, heat-absorbing legs forming a fireplace grate portion, and having an air inlet and an air outlet;

a second plurality of interconnecting, hollow, tubular, air-conducting, heat absorbing legs in communication with said first plurality and disposed over said grate portion, and forming an upper heat-absorbing portion, the legs in said grate portion and said upper heat absorbing portion being interconnected so as substantially to eliminate opposing flows of air as the air travels from said inlet through said grate portion, through said upper heat-absorbing portion and finally out of said outlet;

air moving means for propelling air through said first and second pluralities of air conducting tubular legs from said inlet to said outlet;

air jet means in communication with one of said legs for directing a jet of air onto a flame in said fireplace;

valving means for controlling the flow of air into said air jet means; and

air jet control means, integral with said air jet means, for controlling the direction of said jet of air.

4,185,612

HEAT CIRCULATING FIREPLACE

Clifton F. Briner, Huntington, and Rodney A. Hempel, Fort Wayne, both of Ind., assignors to American Standard Inc., New York, N.Y.

Filed Dec. 2, 1977, Ser. No. 856,713

Int. Cl.[2] F24B *7/00*

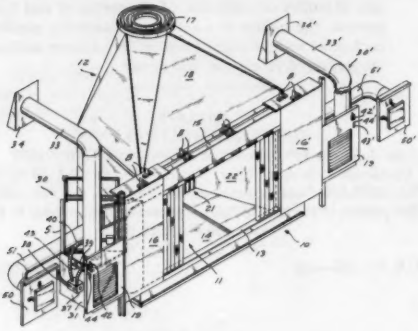
U.S. Cl. 126—122 **34 Claims**

1. An insert module assembly adapted to be mounted in the combustion chamber of a fireplace to recover and utilize substantial quantities of heat energy which normally would be

expelled to the outside atmosphere, said insert module comprising:

an inlet air duct and outlet air duct for conducting air to be heated into and out of said inlet module and being positioned adjacent the rear wall of said combustion chamber;

a heat exchanger formed of sheet metal and defining the front vertical wall of said insert module; said heat exchanger being mounted in fluid communication with said inlet and outlet air duct for increasing the quantity of heat transferred from the combustion gases to the air from said inlet air duct which is to be heated;



said heat exchanger having a plurality of vertically oriented passageways for conducting combustion gases vertically upwards on the one side thereof and a plurality of complementary air passageways on the other side thereof for conducting inlet air to be heated vertically through said passageways;

said insert module having baffle means operatively coupled to said inlet air duct and said heat exchanger for directing all of said inlet air to be heated along said complementary air passageways and into said outlet air duct; and

said heat exchanger defining said vertically oriented passageways having a surface area greater than the surface area of the rear wall of the combustion chamber.

4,185,613

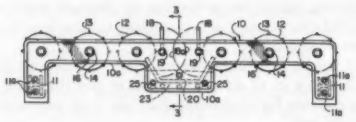
LOG BURNING DEVICE

William Schwartz, 9845 Alpine Dr., Kirtland, Ohio 44094

Filed Nov. 7, 1977, Ser. No. 848,990

Int. Cl.[2] F23H *9/02*

U.S. Cl. 126—181 **3 Claims**



1. A log burning device comprising two parallel rigid side frame members, rigid tie braces secured between said frame members, a plurality of longitudinally spaced rollers mounted independently for individual rotation in said side frame members in groups on opposite sides of the center of said frame members, said rollers extending substantially the full width between said side frame members, each of said rollers tapered from each end toward the center, said rollers at their ends extending above said frame members, each of said rollers having a plurality of longitudinally extending ribs extending radially outwardly for not more than about one-eight of an inch, each rib tapering outwardly to a sharp edge, said ribs evenly spaced circumferentially about said rolls, and each of said rolls having rigid therewith an axial extension laterally outwardly beyond an associated side frame member, said extension non-circular to receive a complementary non-circular handle, whereby the groups on opposite sides of the center may be rotated toward or away from the center, the center of said frame members between said groups of rollers being slightly wider than the spacing of adjacent rollers in said groups, and two planar parallel shields mounted in said frame members, one close to each of said innermost rollers of each of said groups, said shields extending above the top level of the outer ends of said rollers.

4,185,614

HEAT-PRESERVING APPLIANCE FOR CUPS OR OTHER VESSELS

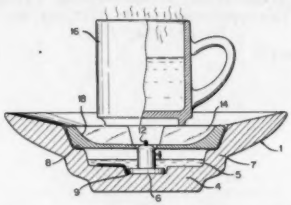
Eiko Egawa, Tokyo, Japan, assignor to Ineko Watanabe, Tokyo, Japan, a part interest

Filed Nov. 28, 1977, Ser. No. 855,420

Claims priority, application Japan, Dec. 9, 1976, 51-164083[U]

Int. Cl.[2] F23C *1/00*

U.S. Cl. 126—265 **7 Claims**



1. An apparatus for heating the contents of a vessel, such as a cup containing a beverage, comprising:

a main body of saucer-like shape, said body having a bottom wall, an upwardly extending side wall and an outwardly extending rim, the interior surface of said side wall comprising a lower side wall portion extending upwardly from the perimeter of the upper surface of said bottom wall and a substantially horizontal wall portion extending outwardly from the upper end of said lower side wall portion, said lower side wall portion and said bottom wall together defining a chamber for receiving a liquid fuel, said horizontal wall portion defining a support surface;

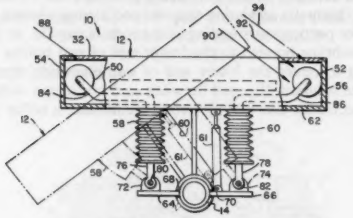
a generally horizontal vessel support member removably mounted on said horizontal wall portion, said support member having a substantially horizontal base wall extending across the upper end of said chamber, said base wall having a central opening therethrough, a plurality of spaced-apart ribs extending upwardly from the upper surface of said base wall and adapted for supporting the vessel, the spaces between said ribs communicating with said central opening so that combustion air can flow to said central opening;

a wick support having a base portion removably supported on the upper surface of said bottom wall of said body and having an upwardly extending head portion extending upwardly through said chamber substantially to said central opening in said base wall, and a wick extending from said chamber into said wick support and thence upwardly through said head portion and into said central opening in said base wall.

4,185,615
SOLAR COLLECTOR STRUCTURE

Edward W. Bottum, 9357 Spencer Rd., Brighton, Mich. 48116

Filed Oct. 11, 1977, Ser. No. 840,775
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—424 6 Claims

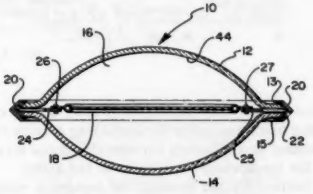


1. A solar collector structure comprising a solar collector including a tubular structure for the passage of fluid therethrough for the purpose of heating the same, a box-like case including a back and at least two parallel vertically extending, spaced apart side walls extending perpendicularly to the back at each side thereof on each side of and in spaced relation to the tubular structure, a vertically extending cylindrical post adjacent to and in spaced relation to the case, means pivotally mounting the case on the post for pivotal movement about the vertical axis of the cylindrical post, a separate container positioned immediately adjacent each side wall of the case whereby the side walls of the case shade the containers from the sun's rays impinging on the case in accordance with the orientation of the case, fixed means secured to the post, bellows positioned between the case and the fixed means secured to the post on each side of the post, conduit means connected between the interior of each container and the interior of the bellows closest thereto, and a charge of volatile fluid in each of said containers, said fluid in each container vaporizing when heated by the sun resulting in pressurizing the connected bellows and tending to cause the bellows to expand and cause the solar collector to pivot about the vertical axis of the post whereby the front of the case will tend to point in the direction of the sun's rays.

4,185,616
SOLAR ENERGY ABSORBER APPARATUS AND METHOD

Steven A. Johnson, 136 North 1st West, Preston, Id. 83263

Filed Aug. 3, 1976, Ser. No. 711,334
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—443 11 Claims

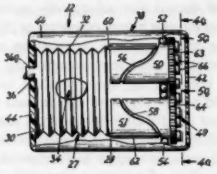


1. An apparatus for absorbing solar energy comprising:
an upper panel fabricated from a transparent material and configurated with an upwardly-curved curvilinear surface, the panel having a planar periphery;
a lower panel configurated with a curvilinear surface and having a planar periphery dimensionally corresponding to the periphery of the upper panel;
means for sealing the periphery of the upper panel to the periphery of the lower panel to create a sealed envelope therebetween;
a partial vacuum in the sealed envelope;
constrictive force means for applying a compressive constrictive force to the periphery of at least the upper panel to compensate for tensile forces imposed on the panel by the partial vacuum in the sealed envelope, the tensile forces being known as the hoop tension and defined (a) for a right circular cylinder as $T=P_oR/t$, where T is the tension as measured in units of force per unit area; R is the radius of the circular section of the cylinder; t is the thickness for a thin-walled cylinder; and P_o is the hydrostatic pressure differential across the surface of the cylinder, (b) for a spherical surface as $[T=P_oR(\mathrm{Sin}^2\phi)/t]$, $T=P_oR/(2t)$ where P_o is the difference in hydrostatic pressure across the sphere; R is the radius of the sphere; and t is the thickness of the thin spherical surface, and (c) for two concentric, right cylindrical surfaces and two concentric, spherical surfaces as $4R_1^2-W_1^2=4R_2^2-W_2^2$ where R_1 is the radius of the inner cylindrical surface; W_1 is the length of the chord for the inner cylindrical surface; R_2 is the radius of the outer cylindrical surface and W_2 is the chord of the outer cylindrical surface; and
a solar energy absorber panel supported between the upper panel and the lower panel.

4,185,617
MAGNETICALLY DRIVEN CARDIAC-ASSIST PUMP SYSTEM

Thomas B. Hutchins, 310 NW. Brynwood La., Portland, Oreg. 97220

Filed Apr. 27, 1978, Ser. No. 900,474
Int. Cl.[2] A61M 1/03; A61F 1/24
U.S. Cl. 128—1 D 4 Claims



2. A magnetically driven cardiac-assist pump system comprising
means defining a changeable-volume pumping chamber including a movable wall portion, movements of which effect changes in the volume of said chamber,
magnetic driven means drivingly connected to said wall portion for moving the same upon actuation of said driven means, and
magnetic driving means magnetically couplable with said driven means for actuating the same,
said driven and driving means each comprising a pair of spaced counterrotative members, with said members in said driven means having faces opposable with faces in said members in said driving means, and with each of said faces carrying means defining an array of magnetic poles.

4,185,618

PROMOTION OF FIBROUS TISSUE GROWTH IN FALLOPIAN TUBES FOR FEMALE STERILIZATION

Harold Corey, Ringwood, N.J., assignor to Population Research, Inc., Clearwater, Fla.

Continuation-in-part of Ser. No. 828,736, Aug. 29, 1977, abandoned, which is a continuation of Ser. No. 646,649, Jan. 5, 1976, abandoned. This application Jun. 26, 1978, Ser. No. 919,267

Int. Cl.[2] A61B *19/00*; A61K *31/78*

U.S. Cl. 128—1 R 25 Claims

1. The method of permanently sterilizing a female subject comprising:

(a) disposing in the fallopian tubes of the subject a mixture of a carrier substance, which forms a gel in situ after being disposed in the fallopian tubes of the subject, and a quantity of fibrous tissue growth promoting agent being present in the mixture in a quantity sufficient to promote fibrous tissue growth and being non-systemically toxic to the subject, and

(b) retaining said mixture therewithin while gelling of the carrier substance takes place.

4,185,619

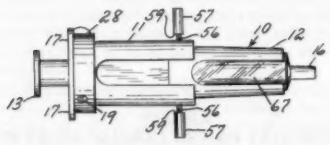
RETRACTABLE SHIELD FOR SYRINGES

James M. Reiss, Center Moriches, N.Y., assignor to Atomic Products Corporation, Center Moriches, N.Y.

Filed Dec. 1, 1975, Ser. No. 636,811

Int. Cl.[2] A61N *5/12*

U.S. Cl. 128—1.1 2 Claims



1. In an improved shield for enclosing a hypodermic syringe containing radioactive materials, including a first shield element of generally hollow cylindrical configuration defining an axially oriented bore, and a second shield element of hollow cylindrical configuration having an outer diameter corresponding to the inner diameter of said bore in said first shield element, improved means for selectively accommodating a plurality of syringes having barrel elements of differing overall diameter, effective length, reticle orientation and flange design, in shielded relation, said means including: a radially extending threaded bore on an upper end of said first shield element, a threaded screw engaged within said threaded bore and penetrating said axially oriented bore; a resilient member having a line of action coaxially positioned relative to the axis of said screw, said resilient means and screw selectively contacting the outer surface of an engaged syringe barrel, adjustment of said screw serving to center the axis of said syringe barrel relative to the axis of said axially oriented bore in said first shield element.

4,185,620

OXYGEN MEASURING ELECTRODE ASSEMBLY

Bunji Hagihara, No. 8-17, Fujishirodai 2-chome, Suita-shi Osaka, Japan

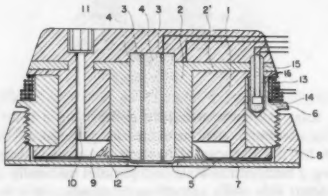
Filed Dec. 22, 1977, Ser. No. 863,561

Claims priority, application Japan, Dec. 29, 1976, 51/158119; Jun. 4, 1977, 52/72996[U]

Int. Cl.[2] A61B *5/00*

U.S. Cl. 128—635 9 Claims

1. An oxygen measuring electrode assembly comprising an electrode portion having a tubular anode electrode and a tubular cathode electrode of a smaller diameter than the said anode electrode and disposed coaxially in said anode electrode, each of said anode and cathode having lower ends, an insulating support member disposed between said anode and cathode and supporting both the electrodes with respect to each other with their lower ends exposed thereby to form said electrode portion having a lower end comprising the lower ends of said anode and cathode, an annular holder portion made of electrically and thermally insulating material and having a lower end, said holder portion surrounding said anode electrode, an electrode membrane bonded to the lower end of said holder portion so as to cover the lower end of said electrode portion, electrolyte solution disposed between said lower end surfaces of said electrodes and said electrode membrane, a collar portion, of a heat conductive metal having a large thermal capacity, surrounding and supporting said holder portion, said collar portion having a lower end, a temperature control means provided in said collar portion for maintaining the temperature of said collar portion at a desired value and a membrane cover plate covering said membrane and thermally connected to the lower end of said collar portion, said membrane cover plate having an opening through which an area of said membrane corresponding to the area of the lower end of said electrode portion is exposed, said membrane cover plate being adapted to transmit heat from said collar portion to the skin of a body to be examined so that a transcutaneous measurement of arterial blood oxygen partial pressure can be made.



4,185,621

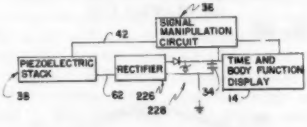
BODY PARAMETER DISPLAY INCORPORATING A BATTERY CHARGER

Richard B. A. Morrow, Corpus Christi, Tex., assignor to Triad, Inc., Robstown, Tex.

Filed Oct. 28, 1977, Ser. No. 846,562

Int. Cl.[2] A61B *5/02*

U.S. Cl. 128—672 9 Claims



1. A body worn body parameter display device comprising

a housing having an array for displaying a value of the body parameter and a battery for energizing the array;

means for connecting the battery to the array;

means carried by the housing for sensing a variable body pressure and delivering an electrical signal representative thereof, the sensing means including piezoelectric means having electrical output means;

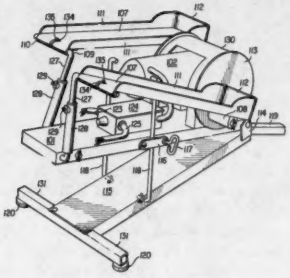
means operatively connected to the housing for applying the sensing means in data transmitting relation to the body of an individual;

means connecting the electrical output means to the display array for displaying a value responsive to the electrical signal generated by the sensing means; and

means for generating and applying electricity to the battery

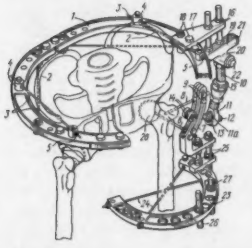
and the array comprising the piezoelectric means and means for connecting the electrical output means to the display array and to the battery.

4,185,622
FOOT AND LEG EXERCISER
Oscar J. Swenson, 630 S. Poplar Way, Denver, Colo. 80224
Filed Mar. 21, 1979, Ser. No. 22,470
Int. Cl.[2] A61H *1/02*
U.S. Cl. 128—25 B **11 Claims**



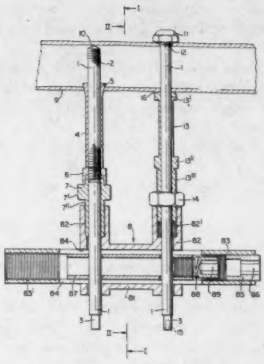
1. A foot and leg exerciser comprising:
a base;
at least one foot pad for supporting a foot of a person using the exerciser, said foot pad having a heel end for supporting the heel of said foot and a toe end for supporting the toe of said foot, the heel and toe ends of the foot pad defining a heel-toe axis;
a double-ended shaft having its major dimension oriented horizontally and transversely to said heel-toe axis and being rotatably journaled in a bearing means mounted on said base, said shaft having at at least on of its ends a crank comprising a crank arm and a crankpin;
the heel end of said foot pad being pivotably attached to the crankpin of said crank, and the toe end of said foot pad being pivotably supported on the upper end of a rocker arm, the lower end of said rocker arm being pivotably attached to said base; and
means for rotating said shaft in said bearing means.

4,185,623
APPARATUS FOR RESTORATION OF HIP JOINT MOBILITY
Mstislav V. Volkov, 1 ulitsa Stroitelei, 6, korpus 1, kv. 63, and Oganes V. Oganesian, ulitsa Pervomaiskaya, 74, kv. 87, both of Moscow, U.S.S.R.
Filed Jul. 18, 1978, Ser. No. 925,800
Int. Cl.[2] A61F *5/00*
U.S. Cl. 128—69 **5 Claims**



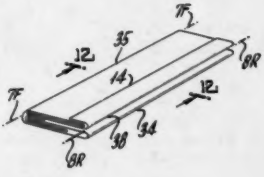
1. An apparatus for the restoration of hip joint mobility, comprising a pelvic yoke intended for being secured in the upper flaring portion of the ilium, traction wires for securing said yoke in said upper flaring portion of the ilium, a distractor connected with said pelvic yoke, a means for adjustable movements of said distractor in two mutually perpendicular, frontal and sagittal planes, a hinged joint for securing said distractor on a thigh bone.

4,185,624
DEVICE FOR EXTERNALLY EXERTING A HOLDING ACTION ON BONE TISSUES
Giulio Gentile, Via S. Martino ai Monti 8, Rome, Italy
Filed May 27, 1977, Ser. No. 801,305
Claims priority, application Italy, May 31, 1976, 49736 A/76; Mar. 28, 1977, 48715 A/77
Int. Cl.[2] A61F *5/04*; A61B *17/18*
U.S. Cl. 128—92 A **12 Claims**



1. A device for externally exerting a holding action on bone tissues comprising:
(a) first mechanical means adapted to engage the bone and extend at least partially therethrough,
(b) said first mechanical means including nails provided with axially slidable members thereon for exerting a holding action on the bone;
(c) second mechanical means for providing adjustment of the holding action in a direction transverse to the bone;
(d) third mechanical means for adjustably clamping said first and second mechanical means in a selected position; and
(e) fourth means for axially adjusting at least one of said nails relative to said third mechanical means.

4,185,625
SURGICAL COVER SHEET
Henrietta K. Morris, Old Bridge, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.
Filed Aug. 18, 1978, Ser. No. 935,059
Int. Cl.[2] A61B *19/06*
U.S. Cl. 128—132 D **3 Claims**



1. Surgical drape comprising a sheet of flexible, drapable

material, said sheet comprising a top edge, a bottom edge, a pair of opposed side edges, said sheet comprising nine sections,

said first section lying between said bottom edge and a first line running transversely of said sheet,

said second section lying between said first transverse line and a second line running transversely of said sheet,

said third section lying between said second transverse line and a third line running transversely of said sheet,

said fourth section lying between said third line and a fourth line running transversely of said sheet,

said fifth section lying between said fourth line and a fifth line running transversely of said sheet,

said sixth section lying between said fifth line and a sixth line running transversely of said sheet,

said seventh section lying between said sixth line and a seventh line running transversely of said sheet,

said eighth section lying between said seventh line and an eighth line running transversely of said sheet,

and said ninth section lying between said eighth line and said top edge;

the largest of said sections being said fifth section, said second and third sections being substantially equal in size,

said fourth section being somewhat larger than said second and third sections,

said first section being smaller than said second and third sections,

said seventh and eighth sections being substantially equal in size,

said sixth section being somewhat larger than said seventh and eighth sections,

and said ninth section being smaller than said seventh and eighth sections;

said sheet being initially forward folded around said third transverse line, then, in sequence, reverse folded around said second line, forward folded around said fourth transverse line, and reverse folded around said first transverse line to provide a first stack of folds overlying at least part of said fifth sections;

said sheet thereafter and in sequence being forward folded around said sixth transverse line, reverse folded around said seventh line, forward folded around said fifth line and reverse folded around said eighth line to provide a second stack of folds overlying at least part of said first stack of folds.

4,185,626

MATERIAL DETECTABLY BY X-RAYS

Graham Jones, Skipton, and Geoffrey Unwin, Kelbrook, near Colne, both of England, assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Dec. 20, 1977, Ser. No. 862,479
Int. Cl.[2] A61L *15/00*
U.S. Cl. 128—156 **6 Claims**

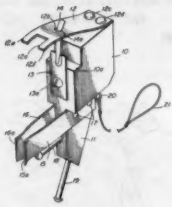
1. An X-ray detectable surgical dressing having incorporated therein a filament of elastomeric material containing from 40 to 90 percent by weight, based on the weight of the elastomer, of an X-ray opaque filler material comprising a non-toxic element of atomic weight above 100, said filament incorporating throughout its length a continuous reinforcing thread.

4,185,627

DEVICE FOR INSERTING SYRINGE

William J. Harris, 129 Hampshire Rd., Wellesley, Mass. 02181

Filed May 11, 1978, Ser. No. 904,909
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—215 **4 Claims**



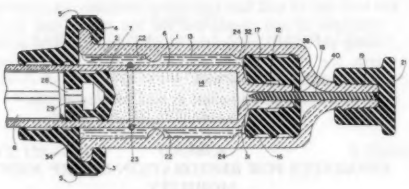
1. A mechanical inserting device for a syringe having a flange on its barrel, comprising: a support; a first horizontal, resilient member attached at one end to the support, its free end being engagable on the flange of a syringe barrel and having an orifice; a vertical, resilient member attached to the support, having a notch on its free end and extending through said orifice so that its notch is releasably engagable with the wall of said orifice; and a pair of resilient members for clasping said syringe, each having one end attached to a lower portion of the support.

4,185,628

COMPARTMENTAL SYRINGE

Rudolph J. Kopfer, 10 Ridgecrest Rd., Kentfield, Calif. 94904

Filed May 31, 1978, Ser. No. 911,203
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—218 M **18 Claims**



1. A compartmental syringe comprising

an outer casing,

a cylinder within the outer casing being spaced from the inner periphery of the outer casing forming an outer chamber, the interior of said cylinder forming an inner chamber, said cylinder being axially reciprocable in said outer housing,

sealing means at one end of the outer casing, said cylinder extending through said sealing means,

a plunger working in the cylinder,

a discharge nozzle on the inner end of the cylinder within said outer casing,

nozzle sealing means normally to seal said discharge nozzle from the outer chamber in an initial position,

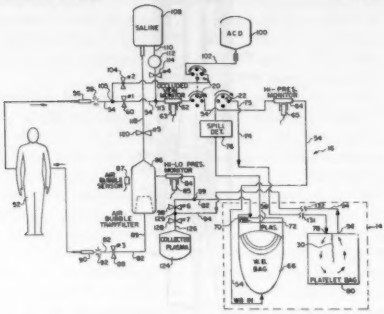
said nozzle sealing means unsealing said nozzle when withdrawn from said nozzle sealing means so as to communicate said inner chamber and outer chamber, whereby the working of the plunger intermixes the contents of the inner and outer chambers and sucks the mixture into the inner chamber, and whereby said nozzle sealing means reseals said nozzle upon the reinsertion of said inner cylinder to said initial position.

4,185,629

METHOD AND APPARATUS FOR PROCESSING BLOOD

Herbert M. Cullis, Silver Spring, Md.; James H. DeVries, McHenry, Ill.; David A. Lohr, Ellicott City, Md.; Rodolfo R. Rodriquez, Columbia, Md., and Michael B. Uffer, Baltimore, Md., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Oct. 18, 1977, Ser. No. 843,222
Int. Cl.[2] A61M *5/00*; B04B *11/00*
U.S. Cl. 128—214 R 54 Claims



1. A method for separating blood components from whole blood including the steps of: withdrawing whole blood from a donor and passing the same through a fluid system; said passing of whole blood through the system including passing the whole blood through a first compartment for centrifuging of the whole blood therein; centrifuging the whole blood to cause separation of the whole blood into components thereof in the first compartment; withdrawing one fluid component out of the first compartment for monitoring the one fluid component and then moving that one compartment through a second compartment for the centrifuging of the one component therein while passing the remaining blood fluid through the first compartment; centrifuging the one fluid component in the second compartment to cause sedimentation of particles therein; recombining the fluid passed through the second compartment with the blood fluid passed through the first compartment; returning the recombined blood fluid to the donor; monitoring the withdrawn one fluid component and sensing withdrawal of other components with the one fluid component; stopping and then reversing movement of the one fluid component when a mixture is sensed to return any mixture of components to the first compartment for separation of the blood components therein; adjusting the difference in rates of withdrawal of whole blood and the one component in response to said sensing of a mixture of components; repeating the above steps until a desired volume of whole blood has been processed followed by isolating and removing the second compartment from the system.

4,185,630

COLOSTOMY APPARATUS

Erich Neumeier, and Douglas J. Marver, both of Mosinee, Wis., assignors to Diamond Shamrock Corporation, Dallas, Tex.

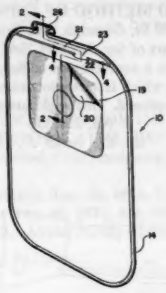
Filed Aug. 15, 1977, Ser. No. 824,808
Int. Cl.[2] A61F *5/44*
U.S. Cl. 128—283 8 Claims

1. In an ostomy collection pouch comprised of front and back sheets of thermoplastic material sealed at their periphery to form said pouch, a relatively soft layer of thermoplastic material integrally sealed to at least a portion of said back sheet of said pouch, said back sheet and soft layer having a stoma-accommodating opening therein and said pouch including a transversely extending gas escape channel in communication with the pouch interior at its upper portion, the improvement comprising:

outwardly extending superposed tabs on said sheets disposed at the upper portion of said pouch;

a gas escape port member, the interior of which is in communication with said gas escape channel and formed by a seal at the edges of said outwardly extending superposed tabs, said port member consisting of a relatively broad head portion and a relatively narrower neck portion joining said port member to said pouch and said gas escape channel and framed by said edge seal, said edge seal having opposing, inwardly extending linear means for signifying a site for initiation of an opening in said port member,

whereby said pouch is initially operative in a first, sealed, non-gas-venting mode and convertible to operation in a second gas-venting but substantially leakproof mode by initiation of said opening to rupture said edge seal.

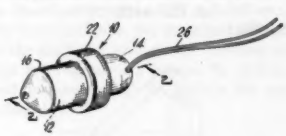


4,185,631

READILY REMOVABLE EXPANDING CATAMENIAL TAMPON

Wesley J. McConnell, Somerset Township, Somerset County, N.J., assignor to Johnson & Johnson

Filed Mar. 17, 1978, Ser. No. 887,698
Int. Cl.[2] A61F *13/20*
U.S. Cl. 128—285 7 Claims



1. A catamenial tampon comprising an absorbent, generally cylindrical body having an insertion end and a withdrawal end;

an annular ring slidably engaged around the absorbent body, said ring comprising a material which expands when emplaced within the vagina; and

means for attachment of said ring to the insertion end of said absorbent body, said means comprising a menstrual fluid pervious elongated sack having a closed end at the bottom portion thereof and an open mouth at the top portion, said cylindrical body being placed in the bottom portion, said sack being closed off about the insertion end of said cylindrical body with the top portion of the sack extending above the insertion end, said ring being affixed to the periphery of said open mouth of the sack and said ring and said top portion of the sack being rolled over the cylindrical body to slidably engage the ring about the cylindrical body;

said tampon being provided with a withdrawal string affixed

to the cylindrical body for removing said tampon from the vagina after use.

4,185,632

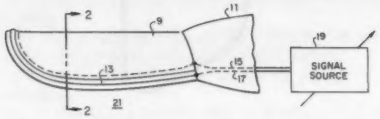
SURGICAL INSTRUMENT HAVING SELF-REGULATED ELECTRICAL SKIN-DEPTH HEATING OF ITS CUTTING EDGE AND METHOD OF USING THE SAME

Robert F. Shaw, 50 St. Germain, San Francisco, Calif. 94114

Continuation-in-part of Ser. No. 534,756, Dec. 2, 1974, Pat. No. 4,089,336, which is a continuation of Ser. No. 63,645, Aug. 13, 1970, abandoned, which is a continuation of Ser. No. 681,737, Nov. 9, 1967, abandoned. This application Mar. 14, 1975, Ser. No. 558,335

Int. Cl.[2] A61B *17/32*

U.S. Cl. 128—303.1 **27 Claims**



1. A blade comprising:

a cutting means including a cutting edge; and

electrical conductor means disposed near said cutting edge, said electrical conductor means including a material being capable of varying the skin depth of the conducting path for alternating electrical current therethrough.

4,185,633

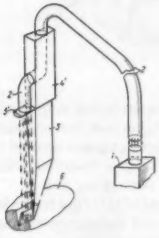
METHOD OF SURGICAL TREATMENT USING LASER EMISSION AND APPARATUS FOR REALIZING SAME

Vladimir N. Prozorov, Varshavskoe shosse, 87, kv. 89; Boris N. Malyshev, ulitsa Butlerova, 24, kv. 219; Boris V. Ognev, ulitsa Myaskovskogo, 33/37, kv. 52; Rostislav A. Troitsky, ulitsa Chaikovskogo, 25, korpus 10, kv. 25, and Alexandr K. Polonsky, ulista Oxkaya, 16, kv. 124, all of Moscow, U.S.S.R.

Filed Sep. 7, 1976, Ser. No. 720,768

Int. Cl.[2] A61B *17/36*

U.S. Cl. 128—303.1 **6 Claims**



1. A surgical treatment method comprising dissecting biological tissue with a cutting edge of a mechanical cutting means and directing a laser beam from a location spaced from said cutting edge to form therefrom a spot situated in the immediate proximity of the cutting edge just behind said mechanical cutting means in the direction of movement thereof during dissection substantially simultaneously with the dissection of the tissue for effecting photocoagulation of the dissected tissue.

4,185,634

SURGICAL INSTRUMENT

Bruce M. Freedman, 70 Brook Rd., Milton, Mass. 02187

Filed Dec. 27, 1977, Ser. No. 864,280

Int. Cl.[2] A61B *17/32*

U.S. Cl. 128—314 **6 Claims**

1. A surgical instrument comprising:

a stem portion, and

a blade portion extending from the stem portion,

said blade portion being elogated having a linearly extending cutting edge along one side thereof and an incising edge at the tip of the blade portion contiguous with the cutting edge and extending arcuately in a U-shape about the tip partially along and terminating at the other side of the blade portion,

the cross-section of the blade portion along the cutting edge being beveled on said one side and flat dull edged on said other side except at the incising edge,

the major length of said other side of said blade portion being dulled and generally parallel to the cutting edge,

the width of said blade portion being on the order of 1–3 millimeters,

the thickness of said blade portion being on the order of 0.25–1.0 millimeter, and

the length of the incising edge extending about the other side of the blade portion being at least 1 millimeter but less than the total length of the blade portion.

4,185,635

ANIMAL EAR TAG APPLICATOR

John R. Burford, and Paul Slater, both of Palmerstron North, New Zealand, assignors to Delta Plastics Limited, Palmerston North, New Zealand

Filed Apr. 27, 1977, Ser. No. 791,607

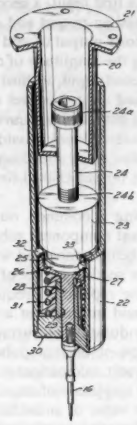
Claims priority, application New Zealand, Apr. 29, 1976, 180734

Int. Cl.[2] A01K *11/00*; A61B *17/00*

U.S. Cl. 128—330 **20 Claims**

15. An applicator for animal ear tags comprising: a body which includes a handle; lever means pivotally coupled to said body; first ear tag component retention means mounted by said body at a position spaced away from said pivot; a first member coupled to said lever means and carried by said body to be movable rectilinearly toward said first retention means by movement of said lever means relative to said handle; a second member mounted upon and rectilinearly movable relative to said first member; second ear tag component retention means mounted by said second member in an opposing relationship with said first retention means; means for moving said second member relative to said first member; locking means coupling said second member to said first member; and actuating means

operable to release said locking means when said first member has moved a determined distance toward the first retention



means and so permit said moving means to move said second member relative to said first member in a rectilinear direction away from said first ear tag component retention means.

4,185,636

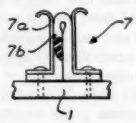
SUTURE ORGANIZER, PROSTHETIC DEVICE HOLDER, AND RELATED SURGICAL PROCEDURES

Shlomo Gabbay, Bronx, and Robert Frater, Bronxville, both of N.Y., assignors to Albert Einstein College of Medicine of Yeshiva University, Bronx, N.Y.

Continuation-in-part of Ser. No. 781,538, Mar. 28, 1977, abandoned. This application Dec. 29, 1977, Ser. No. 865,481

Int. Cl.² A61B *17/04*

U.S. Cl. 128—334 R **11 Claims**



1. A suture holder and organizer; comprising:

(a) a base member;

(b) at least one pair of spaced arms extending upwardly from said base member;

(c) resilient means disposed in said space between said pair of said spaced arms so as to be compressed therebetween but so as to permit the releasable insertion of a suture between said resilient means a surface of one said arm proximate said resilient means, said resilient means comprising a strip having a portion disposed between said spaced arms, said spaced arms being more rigid than said strip so as to compress said strip between said spaced arms.

4,185,637

COATING COMPOSITION FOR SUTURES

Frank V. Mattei, Piscataway, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed May 30, 1978, Ser. No. 910,263

Int. Cl.² A61L *17/00*

U.S. Cl. 128—335.5 **20 Claims**

1. A multifilament suture having improved tie-down properties, said suture being coated with from about 1 to 5 percent by weight of the dry residue of a composition comprising a gel of a polyvalent metal ion salt of a C_6 or higher fatty acid in a volatile organic solvent.

4,185,638

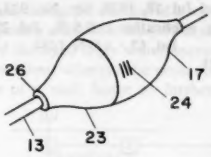
PRESSURE INDICATORS FOR INFLATABLE CUFF-TYPE CATHETERS

James D. Bruner, Englewood, Colo., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 591,601, Jun. 30, 1975, Pat. No. 4,016,885. This application Jan. 10, 1977, Ser. No. 758,309

Int. Cl.² A61M *16/00, 25/00*

U.S. Cl. 128—349 B **2 Claims**



2. An inflatable cuff-type catheter for insertion into a body passage comprising in combination a flexible tube having distal and proximal ends, at least one gas inflatable cuff encircling the flexible tube near the distal end and having opposite ends sealed thereto; a branched tube connected at an inner end to the interior of the cuff; and an inflation means and a pressure indicator means connected in series to the cuff through the outer end of the branch tube for access outside the body passage, the indicator means comprising an expandable chamber having opposite ends attached and sealed to the branched tube which communicates with the interior of the chamber, the expandable chamber having at one end a cone-shaped shell encircling the chamber, the apex end of the shell encircling and adhered to the branched tube, the chamber having indicia on the surface of the shell end, wherein the chamber upon expansion is adapted to progressively expose the indicia and by a pre-determined progression of the indicia the gas pressure within the inflatable cuff.

4,185,639

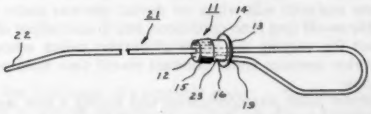
ADJUSTABLE STOP FOR ENDOTRACHEAL TUBE GUIDE

Gerald S. Linder, 16693 Charmel La., Pacific Palisades, Calif. 90272

Filed Mar. 27, 1978, Ser. No. 890,401

Int. Cl.² A61M *25/00*

U.S. Cl. 128—200.26 **11 Claims**



1. An adjustable stop adapted for use with an endotracheal tube guide, comprising in combination:

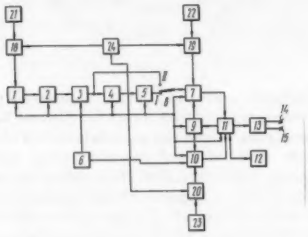
(a) a cylindrical body of resilient material having first and second end surfaces;
(b) a central bore extending coaxially through said cylindrical body between the first and second end surfaces, the diameter of said central bore being sufficient to permit the adjustable stop to slide over the surface of the endotracheal tube guide; and
(c) at least one hole extending partially into said cylindrical body from one of the first or second end surfaces, said one hole being approximately parallel to and laterally offset from said central bore, the diameter of said one hole being smaller than the diameter of the endotracheal tube guide to permit an expansion of the resilient material about said one hole upon insertion of one end of said endotracheal tube guide therein and thereby provide a clamping force on the tube guide within said central bore.

4,185,640

DEVICE FOR PULSE CURRENT ACTION ON CENTRAL NERVOUS SYSTEM

Eduard M. Kastrubin, and Valentin M. Mozhnikov, both of Moscow, U.S.S.R., assignors to Moskovsky Oblastnoi Nauchno-Issievovatelsky Institut Akusherstva I. Ginekologii, U.S.S.R.

Filed Jul. 18, 1978, Ser. No. 925,799
Claims priority, application U.S.S.R., Jul. 29, 1977, 2503851
Int. Cl.[2] A61N *1/34*
U.S. Cl. 128—421 **1 Claim**



1. A device for pulse current action upon the central nervous system, comprising:
a rhythmic action unit having a first input, a second input and an output;
a unit for separate adjustment of the repetition frequency and duration of current pulses, having a first input, a second input and an output and connected with its first input to the output of said rhythmic action unit;
an intermittent analgesia unit having a first input, a second input and an output and connected with its first input to said output of said unit for separate adjustment of the repetition frequency and duration of current pulses;
a unit for adjusting the duration of current pulses, having a a first input, a second input and an output and connected with its first input to said output of said intermittent analgesia unit;
a unit for varying the shape of current pulses, having a first input, a second input and an output and connected with its first input to said output of said unit for adjusting the duration of current pulses;
a switch electrically coupled to said output of said intermittent analgesia unit when the device operates under variable on-off time ratio conditions, and to said output of said unit for varying the shape of current pulses when the device operates under constant on-off time ratio conditions;
a current pulse preamplification unit having a first input, a second input, a third input, a fourth input and an output and connected with its first input to said switch;
a patient protection unit having a first input, a second input, a first output and a second output and connected with its first output to said third input of said current pulse preamplification unit;
a unit for adjusting the value of an additional constant component, having a first input, a second input, a third input, a fourth input and an output and connected with its first input to said second output of said patient protection unit;
a unit for adjusting the amplitude of current pulses, having a first input, a second input, a third input, a first output, a second output and a third output and connected with its first input to said output of said current pulse preamplificaton unit, with its third input to said output of said unit for adjusting the value of an additional constant component, and with its first output to said first input of said patient protection unit;
a power unit having a common output and including an additional constant component subunit having an output, said power unit being connected with its common output to the respective second inputs of said unit for separate adjustment of the repetition frequency and duration of current pulses, said intermittent analgesia unit, said unit for adjusting the duration of current pulses, said unit for varying the shape of current pulses, said current pulse preamplification unit, said patient protection unit, said unit for adjusting the amplitude of current pulses and said unit for adjusting the value of an additional constant component whose third input is connected to said output of said additional constant component subunit;
a first switch means connected to said first input of said rhythmic action unit;
a regulator of a first pulse action parameter, i.e. the current pulse repetition frequency, electrically coupled to said first switch means;
a second switch means connected to said fourth input of said current pulse preamplification unit;
a regulator of a second pulse action parameter, i.e. the amplitude of current pulses, electrically coupled to said second switch means;
a third switch means connected to said fourth input of said unit for adjusting the value of an additional constant component;
a regulator of a third pulse action parameter, i.e. the value of the additional constant component, electrically coupled to said third switch means;
a remote-control electroanalgesia unit electrically coupled to said first switch means, said second switch means and said third switch means so that according to the position of said switch means, each of said pulse action parameters is controlled by at least one of the units selected from the group consisting of said remote-control electroanalgesia unit and said regulators taken in a prescribed combination;
a current pulse amplitude indicator having an input and connected with its input to said second output of said unit for adjusting the amplitude of current pulses;
a mean current intensity indicator having an input and an output and connected with its input to said third output of said unit for adjusting the amplitude of current pulses;
electrodes, i.e. an anode and a cathode, connected to said output of said mean current intensity indicator and intended to receive said current pulses, said anode being attached in the neck areas, under the mastoids, whereas said cathode is attached in the forehead area.

4,185,641

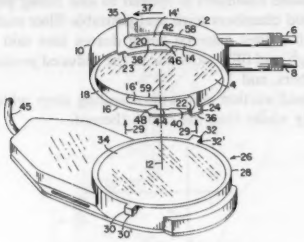
PRESSURE DOME

Thaddeus G. Minior, Tewksbury, and Alexander Tykulsky, Carlisle, both of Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 23, 1978, Ser. No. 936,168
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—675 **2 Claims**

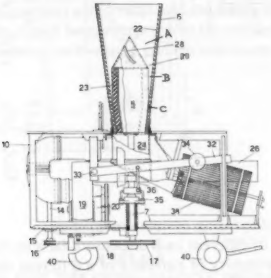
1. A pressure dome for attachment to a transducer having outwardly extending projections, comprising

a body having a hollow formed therein,
a flexible membrane,
means mounting said membrane across said hollow so as to form a space therebetween,
ports extending through said body so as to provide access to said hollow from a point outside said body, and



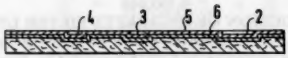
resilient tongues extending from said body on the side opposite said membrane from said hollow, said tongues lying within a cylinder having an axis perpendicular to said membrane and having ramps sloping toward said membrane from their ends and
means defining detent notches next to said ramps.

4,185,642
THRESHER
Ian G. Ridgway, Urrbrae, Australia, assignor to The University of Adelaide, Adelaide, Australia
Filed Feb. 22, 1978, Ser. No. 880,197
Claims priority, application Australia, Mar. 1, 1977, PC9241
Int. Cl.[2] A01F 7/02
U.S. Cl. 130—27 R **20 Claims**



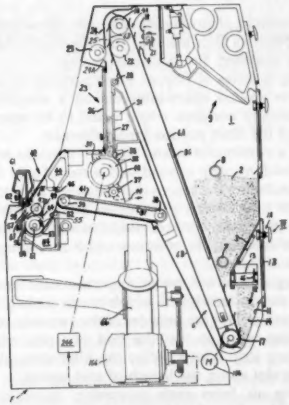
1. A thresher for grain comprising a rotor member and a stator member disposed one within the other on a substantially vertical axis to define an annular threshing space therebetween, the outer said member having at least part of its inner surface defining an envelope of truncated conical form, the inner said member having at least part of that surface which is adjacent to the said surface of the outer member defining a truncated cone of similar angle to the envelope whereby the inner surface of the outer member and the outer surface of the inner member define between them the said annular threshing space, means to drive the rotor about its axis, one of said surfaces being faced with resilient material and the other with a friction producing material the larger diameter of the said members being upwardly disposed, the thresher being adapted to have grain to be threshed and be fed into the said annular space at its upper end, support means for the said rotor and the said stator arranged for one to be axially movable in relation to the other to vary the distance between the said surfaces, and means to urge the one said member axially in relation to the other in a direction to decrease the distance between the said facings on the said surfaces whereby the seed enters between the said facings and is moved downward between the said facings to remove the hull from the seed to discharge at least the seed from the bottom of said annular threshing space.

4,185,643
MOUTHPIECE PAPER FOR CIGARETTES
Walter Riedesser, Neustadt, Fed. Rep. of Germany, assignor to Julius Glatz GmbH, Neidenfels, Fed. Rep. of Germany
Filed Dec. 19, 1977, Ser. No. 861,970
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1977, 2743986
Int. Cl.[2] A24D 1/04
U.S. Cl. 131—12 **5 Claims**



1. In a mouthpiece paper for cigarettes which has the appearance and properties of cork including a dyed paper base layer having a matt luster and randomly stamped depressions on the dyed layer simulating the surface of a layer of cork, the improvement comprising a suitable lacquer layer coated over the entire surface of the dyed layer which increases the luster of the stamped depressions whereas the areas surrounding the depressions remain of a matt luster to further simulate the properties of cork.

4,185,644
DISTRIBUTOR FOR CIGARETTE MAKERS OR THE LIKE
Uwe Heitmann, Schwarzenbek; Wolfgang Steiniger, Bornsen; Joachim Pfannmuller; Heinz-Christen Lorenzen, both of Hamburg; Franz-Peter Koch, Wangelau, and Norbert Lange, Glinde, all of Fed. Rep. of Germany, assignors to Hauni-Werke Korber & Co. KG., Hamburg, Fed. Rep. of Germany
Filed Sep. 19, 1977, Ser. No. 834,782
Claims priority, application United Kingdom, Sep. 24, 1976, 39676/76
Int. Cl.[2] A24B 7/14
U.S. Cl. 131—109 R **10 Claims**



1. In the distributor of a cigarette maker or the like wherein particles of fibrous material are converted into a continuous rod-like filler, the combination of a duct having open first and second ends; means for admitting into said duct particles of fibrous material by way of said first end so that the particles

form a column, successive increments of which advance toward, and which column has a leader at, said second end, said duct comprising a wall at one side of said column; a conveyor having spaced-apart particle-removing elements arranged to travel along a predetermined path a portion of which is adjacent to said second end and is spaced apart from said wall whereby said elements remove fibrous material from the leader of the column in said duct; and a homogenizing device disposed between said portion of said path and said wall and including means for substantially uniformly distributing fibrous material between the elements advancing beyond said portion of said path; and means for imparting to said device oscillatory movements in a direction substantially transversely of said path.

4,185,645

PRODUCTION OF CIGARETTE FILTER UNITS

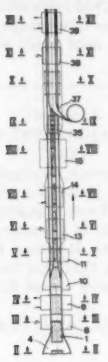
Serge Boegli, Zurich, and Jean-Pierre Lebet, Montreux, both of Switzerland, assignors to F. J. Burrus & Cie, Boncourt and Baumgartner Papiers S.A., Crissier, both of, Switzerland

Continuation of Ser. No. 748,500, Dec. 8, 1976, abandoned. This application Jul. 21, 1978, Ser. No. 926,797

Claims priority, application Switzerland, Dec. 8, 1975, 15905/75; Nov. 26, 1976, 14907/76

Int. Cl.[2] **A24C** *5/50*

U.S. Cl. 131—261 R **30 Claims**



1. In a method of producing cigarette filter units in which portions of fibrous filter material and of pourable filter material are serially disposed, the steps comprising:

arranging a series of fibrous filter portions at substantially uniform spaced apart intervals on a sheathing strip of substantially constant width equal to between 75% and 93% of the filter portion circumference,

forming a continuous strand of filter portions by wrapping the sheathing strip around said series of said fibrous portions including the spaces therebetween and attaching said strip to said fibrous portions so as to define successive empty chambers between said fibrous portions and filler slots of substantially constant width extending the length of said chambers,

conveying said strand under a suction zone having lateral walls, the undersides of which are in sealing and sliding relationship with the outsides of the two side edges of said sheathing strip, so that the said two side edges of said sheathing strip which define the filler slots, also define a suction slot along the length of said strand,

evacuating air from each successive, in closed-off state, empty chamber of said strand by continuously applying suction to said chambers being in closed-off state through said suction slot,

transferring said strand in closed-off state to a filling zone containing dispensable pourable filter material, the filling zone having lateral walls, the undersides of which are in sealing and sliding relationship with the outside of the two side edges of said sheathing strip, so that the chambers in said strand are maintained in closed-off state under reduced pressure until said chambers reach said filling zone and so that said filler slots pass beneath a filling port containing said pourable filter material where each of said evacuated chambers is opened to said filling port;

filling said chambers with said pourable filter material, said pourable filter material being drawn into said chambers through said filler slots due to the reduced pressure in said chambers, and

sealing said suction slot with a sealing strip which is only slightly wider than the width thereof.

4,185,646

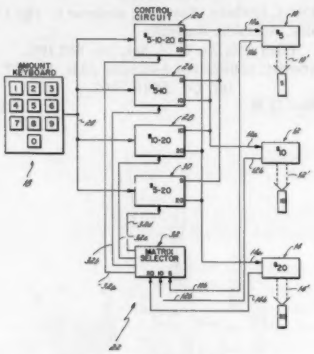
CONTROL CIRCUIT FOR MULTI-DENOMINATION CASH DISPENSER

Thomas H. Woods, Middletown, and Thomas R. Aultz, Cincinnati, both of Ohio, assignors to TRW Inc., Los Angeles, Calif.

Filed Aug. 15, 1977, Ser. No. 824,493

Int. Cl.[2] **G07D** *1/00*

U.S. Cl. 133—4 R **7 Claims**



1. A cash dispensing system comprising:

a plurality of different cash dispensers each having provision for an inventory of currency of a different denomination, each said different denomination dispenser being operative independently of the others to dispense currency of its respective denomination in response to dispenser control signals input thereto,

a keyboard for entering a single amount of money representing an aggregate amount to be collectively dispensed in a mix of different denominations from said different denomination cash dispensers, said keyboard providing electrical signals on an output thereof representing said aggregate amount entered therein,

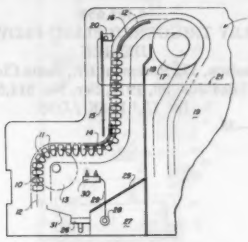
a control circuit responsive to said aggregate amount signals for simultaneously providing separate dispenser control signals to said plurality of different denomination dispensers for simultaneously actuating said different denomination dispensers to dispense, in a minimum amount of time, said aggregate amount entered into said keyboard, regardless of the value thereof, with a currency denomination mix which includes, to the extent possible considering the aggregate amount and the denominations available, substantially equal quantities of each denomination.

4,185,647

CONTAINER CLEANING MACHINE

Momir Babunovic, Chesterfield, Mo., assignor to Barry-Wehmiller Company, St. Louis, Mo.

Filed Sep. 5, 1978, Ser. No. 939,412
Int. Cl.[2] B08B 3/02
U.S. Cl. 134—60 **12 Claims**



1. A container cleaning machine using a heated liquid cleaning medium and comprising an endless conveyor having pockets for supporting the containers during cleaning, a container loading end portion, a container discharge end portion, said endless conveyor moving containers between said loading and discharge end portions, said endless conveyor in the loading end portion being directed to move along a rising path in which said pockets and the containers therein are in generally superposed relation, liquid cascade means mounted in fixed position adjacent said rising path of movement of said endless conveyor for directing liquid upon said endless conveyor pockets and the containers therein in opposition to the direction of travel of the conveyor pockets, and liquid collecting and moving means in the discharge end portion connected to said liquid cascade means for delivering liquid to said liquid cascade means at a heat acquired in said discharge end portion, said heat in the liquid being imparted to the pockets and containers in said rising path of said endless conveyor.

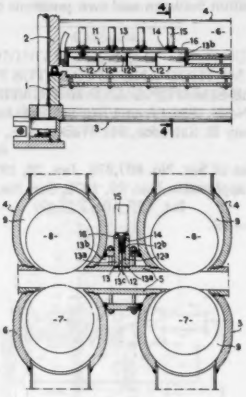
4,185,648

MACHINE FOR TREATING SHEETS OF VARIABLE WIDTH

Alfred M. J. Germain, Grande Synthe, France, assignor to Union Siderurgique du Nord et de l'Est de la France, "USINOR", Paris, France

Filed Dec. 28, 1978, Ser. No. 974,017
Claims priority, application France, Dec. 30, 1977, 77 39834
Int. Cl.[2] B08B 3/04
U.S. Cl. 134—122 R **7 Claims**

1. A machine for treating, and in particular cooling, metal sheets, comprising a lower frame and an upper frame, sets of sheet guiding and driving rollers carried by the upper frame and lower frame, a case carried by each frame and surrounding the rollers and defining an enclosure for cooling fluid, said cases having first zones surrounding the rollers and second zones between the first zones, baffle means disposed in at least some of the second zones of the case and housings combined with the baffle means, the baffle means being movable between a position in which the baffle means are withdrawn into the housings and a position in which the baffle means extend out of the housings and create a transverse barrier in regions of the enclosure and thereby reduce the effective transverse width of the enclosure of the machine and promote the flow of the



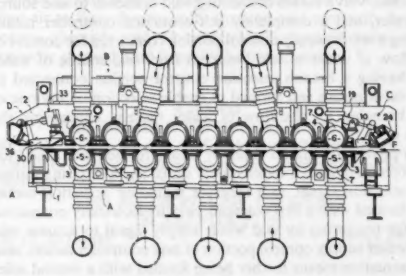
cooling fluid in the central zone of the enclosure of the machine in which the sheet travels.

4,185,649

ARRANGEMENT OF THE INPUT AND OUTPUT ENDS OF A METAL SHEET COOLING MACHINE

Alfred M. J. Germain, Grande Synthe, France, assignor to Union Siderurgique du Nord et de l'Est de la France, "USINOR", Paris, France

Filed Dec. 28, 1978, Ser. No. 974,016
Claims priority, application France, Dec. 30, 1977, 77 39835
Int. Cl.[2] B08B 3/04
U.S. Cl. 134—122 R **12 Claims**



1. An arrangement for a machine for cooling a metal sheet, which machine comprises a lower frame and an upper frame, sets of rollers respectively carried by the frames for rollingly supporting the sheet by contact with upper and lower faces of the sheet, each frame comprising lateral walls which extend longitudinally of the machine and are spaced apart transversely of the machine, and a case interconnecting the lateral walls and defining an enclosure, and means for supplying a cooling fluid to said enclosure, the cases of the upper and lower frames defining an input longitudinal end and an output longitudinal end of the machine, said arrangement comprising at each of said longitudinal ends at least one flap mounted on the machine to be pivotable about an axis which extends transversely of the machine and transversely of the direction of travel of the sheet through the machine, between two extreme positions one of which positions corresponds to the complete closure of the corresponding end of the machine whereas the other position

corresponds to a withdrawn position of the flap allowing the passage of a sheet, of maximum thickness and an actuating mechanism combined with each flap for putting the flap in a selected position between said two positions of the flap.

4,185,650

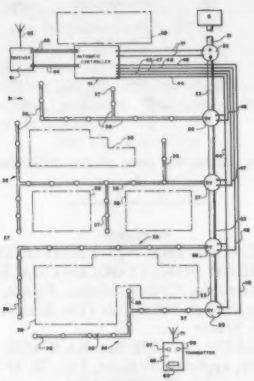
METHOD AND APPARATUS FOR TROUBLE-SHOOTING AND IRRIGATION SYSTEM

William T. Neves, 856 Linda Vista St., San Jose, Calif. 95127, and Anthony R. Salvador, 511 Webster Dr., Martinez, Calif. 94553

Continuation of Ser. No. 807,878, Jun. 20, 1977, abandoned. This application Dec. 20, 1978, Ser. No. 971,536

Int. Cl.[2] A01G *25/00*

U.S. Cl. 137—15 **7 Claims**



1. A method for trouble-shooting an irrigation system having a source of water, a plurality of independent irrigation branches, valve means connecting said branches to said source of water, and a completely self-contained controller means having a water supply control portion connected for control of the flow of water to said branches from said source of water and having a branch selection control portion connected to said valve means and formed to enable selection of any one of said branches for the flow of water therein, comprising the steps of:

(a) providing a radio receiver means formed and tuned for receipt of both a water supply signal and a differing station selection signal, said receiver including actuation means formed with a first solenoid switch electrically connected for triggering by said water supply signal to actuate said water supply control portion of said controller means, said actuation means further being formed with a second solenoid switch electrically connected for triggering by said differing station select signal to actuate said branch selection control portion of said controller means;

(b) without modifying the electrical circuitry of said self-contained controller means, electrically connecting a first output connections of said radio receiver means to said water supply control of said controller means for actuation thereof;

(c) without modifying the electrical circuitry of said self-contained controller means, electrically connecting a second output connections of said radio receiver to said branch selection control portion for actuation thereof;

(d) carrying a radio transmitter formed for selective transmission of said water supply signal and said station selection signal to an area remote of said controller means and proximate a suspected source of trouble in said irrigation system;

(e) while proximate the suspected source of trouble, transmitting a station select signal to said receiver means;

(f) while proximate the suspected source of trouble, transmitting a water supply signal to said receiver means;

(g) terminating said water supply signal prior to attempting to repair said irrigation system; and

(h) thereafter transmitting a second water supply signal to said receiver means to enable testing of the repaired irrigation system.

4,185,651

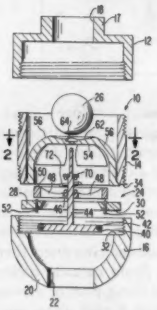
INERTIALLY TRIGGERED FLUID FLOW CONTROL DEVICE

Eugene K. Paulson, 351 Rosemont Dr., Santa Clara, Calif. 95051

Filed Jun. 30, 1977, Ser. No. 811,520

Int. Cl.[2] F16K *17/36*

U.S. Cl. 137—38 **11 Claims**



1. A control device comprising: a housing having a fluid flow path therethrough; a valve in the housing and including a valve member provided with a valve stem, said valve member being movable from a first position closing said path to a second position opening said path; means biasing the valve and valve stem in an upward direction; a ball; means including a plurality of spaced legs for supporting the ball in an operative location in the housing above the valve stem, said legs extending outwardly and downwardly from the zone at which the ball is supported, said housing having means for supporting the lower ends of the legs, said fluid flow path extending between the legs, the weight of the ball being greater than the bias force of said bias means, said ball being operable to hold said valve member in one of said positions and being movable laterally of said operative location in response to a force exerted on the ball, said valve stem movable upwardly of the support means when the ball moves laterally to cause the valve member to move from said one position to the other position.

4,185,652

SUBAQUEOUS SEQUENCE VALVE MECHANISM

Howard Zintz; Richard C. Fisher, both of Walnut Creek, and John F. Gee, Oakland, all of Calif., assignors to NL Industries, Inc., Hightstown, N.J.

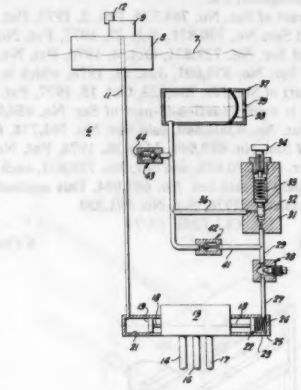
Filed Oct. 31, 1977, Ser. No. 846,723

Int. Cl.[2] E21B *43/01*

U.S. Cl. 137—81 **5 Claims**

1. A subaqueous sequence valve mechanism comprising a main valve adapted to be disposed in the water below the surface thereof, a first expansible chamber hydraulic actuator secured to and effective to operate said main valve, means above said surface for supplying hydraulic fluid under pressure, means connecting said supplying means to said first expansible chamber, a second expansible chamber secured to and opposing operation of said main valve by said first expansible chamber actuator, a hydraulic fluid accumulator having a movable barrier, means for hydraulically connecting said second expansible chamber and said hydraulic fluid accumulator on one side of said movable barrier, means for connecting said

hydraulic fluid accumulator on the other side of said movable barrier to said water, a spring, means disposing said spring to resist the contraction of said second expansible chamber, a



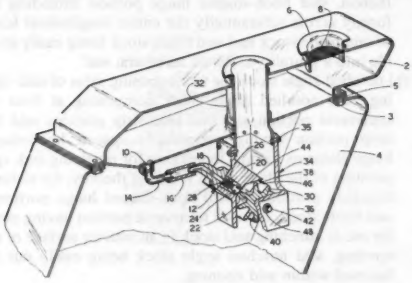
relief valve, means for connecting the upstream side of said relief valve and said second expansible chamber, and means for connecting the downstream side of said relief valve and said hydraulic fluid accumulator on said one side of said barrier.

4,185,653

LIQUID METERING AND MIXING DEVICE

Dan H. Armstrong, 1435 Slate Run Rd., and Larry G. Kamerer, 2402 Lyon La., both of New Albany, Ind. 47150

Filed Nov. 17, 1977, Ser. No. 852,193
Int. Cl.[2] B67D *5/04*
U.S. Cl. 137—114 **3 Claims**



1. A liquid metering and mixing device for two liquids comprising:

a housing;

a rotatable measuring member mounted transversely to opposite sides of said housing, said measuring member including a plurality of liquid receptacles and a plurality of outwardly extending fingers circumferentially spaced around the axis of the measuring member, said rotatable member moves in reponse to filling of one of said receptacles with a first liquid from a first liquid source; and,

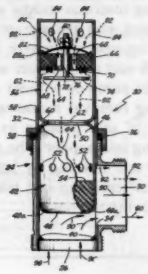
a valve means having an inlet in flow communication with a second liquid source and an outlet in flow communication with said measuring member, said valve means including a valve body with a seat therein, a valve ball disposed in opening and closing relation with said seat, and a ball retaining spring received within said valve body and in retaining position with said valve ball, said valve ball being movable in response to engagement with said outwardly extending fingers of said measuring member whereby said first liquid and said second liquid are mixed in said receptacles.

4,185,654

ANTI-SIPHONING DEVICE FOR VENTING DRAIN LINES

Lyle M. Young, 1807 W. Minnehaha, St. Paul, Minn. 55104

Filed Oct. 4, 1978, Ser. No. 948,385
Int. Cl.[2] F16K *24/00*
U.S. Cl. 137—218 **5 Claims**



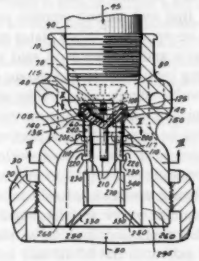
1. An anti-siphoning device for draim lines comprising a T-shaped valve body having a downwardly facing opening, an upwardly facing opening and an intermediate laterally facing opening, a generally hollow cylindrical float valve constrained for vertical movement within said body having a closed lower end for normally closing said downwardly facing opening but permitting liquid to buoy said float valve upwardly to allow waste water to flow upwardly through said downwardly facing opening and outwardly through said laterally facing opening, said float valve having an open upper end and having circumferentially spaced holes intermediate its ends for enabling air to flow downwardly through said upwardly facing opening, through said circumferentially spaced holes, and outwardly through said laterally facing opening.

4,185,655

SUBMERSIBLE PUMP CHECK VALVE

Robert D. Wilkes; Eugene C. Smith, both of Little Rock, and David E. Ufford, Benton, all of Ark., assignors to Jacuzzi Brothers, Inc., Little Rock, Ark.

Filed Jan. 26, 1978, Ser. No. 872,445
Int. Cl.[2] F16K *15/02*
U.S. Cl. 137—315 **11 Claims**



1. A check valve for use with a pump comprising:

a housing through which a fluid is to freely flow in only one direction mechanically mountable on the output port of a pump;

said housing having a first and a second port connected by a passage so that there exists a path for the fluid through said housing joining said ports;

said path having a restriction substantially perpendicular to said one direction of flow through said passage at a given point within said housing;

a poppet movably mounted in said passage, adjacent to and cooperative with said restriction to permit flow of the fluid in said one direction through said passage from said first port to said second port and to block flow of the fluid opposite said one direction through said passage from said second port to said first port;

said poppet having insertion means which cooperate with said restriction of said passage to slightly distort said poppet permitting said poppet to be inserted into said housing through said second port without removing said housing from the pump or without removing the pump;

said poppet having removal means which cooperate with said restriction of said passage to slightly distort said poppet permitting said poppet to be removed through said second port of said housing by rotating it in a second direction without removing said housing from the pump or without removing the pump.

4,185,656

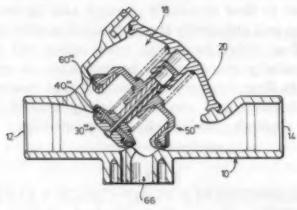
DUAL CHECK VALVE STRUCTURE

Heinz W. Braukmann, Willowdale, Canada, assignor to Braukmann Armaturen AG, Rothrist, Switzerland

Filed Dec. 13, 1977, Ser. No. 860,061

Int. Cl.[2] F16K *15/06*

U.S. Cl. 137—512.3 **7 Claims**



1. A check valve assembly including a conduit body having an inlet and an outlet on a longitudinal axis thereof and first and second check valves in said conduit body, said check valves respectively having first and second valve stems moveable along a common axis inclined to said longitudinal axis, in the direction of flow, first and second annular valve seats to said conduit body and co-operating valve plates normally disposed to said common axis and mounted on said valve stems, said check valves having individual spring means surrounding said first and second valve stems, engageable with said conduit body, and acting on said valve plates to move them opposite to the direction of flow to engage their respective valve seats and terminate flow from said inlet to said outlet when there is sufficient drop in pressure of the flow in said conduit body, said first check valve being upstream of said second check valve and said second annular valve seat having a larger diameter than said first valve seat, said first valve plate having a lift along its common axis with the lift of said second valve plate sufficient to enable fluid flowing from the inlet to the outlet, when the check valves are open, to flow over the lower perimeter of each of said annular valve seats in a substantially straight line from the inlet to the outlet and said conduit body having removable means for securing said check valves in position.

4,185,657

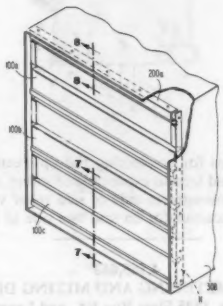
ECONOMY, ANGLE-BLADE DAMPER KIT

Francis J. McCabe, Doylestown, Pa., assignor to Prefco Products, Inc., Buckingham, Pa.

Continuation-in-part of Ser. No. 764,774, Feb. 2, 1977, Pat. No. 4,114,646, and Ser. No. 770,831, Feb. 22, 1977, Pat. No. 4,113,230, and Ser. No. 729,831, Oct. 4, 1976, Pat. No. 4,113,232, and Ser. No. 874,001, Jan. 31, 1978, which is a continuation-in-part of Ser. No. 736,823, Oct. 18, 1977, Pat. No. 4,080,860, which is a continuation-in-part of Ser. No. 650,926, Jan. 21, 1976, Pat. No. 4,004,480, said Ser. No. 764,774, is a continuation of Ser. No. 689,994, May 26, 1976, Pat. No. 4,081,173, said Ser. No. 770,831, and Ser. No. 729,831, each is a continuation-in-part of said Ser. No. 689,994. This application Mar. 29, 1978, Ser. No. 891,330

Int. Cl.[2] F24F *13/14*

U.S. Cl. 137—601 **6 Claims**



1. A kit for constructing a damper inside an opening, said kit comprising:

(a) blade stock having a hook-shaped hinge portion formed therein, said hook-shaped hinge portion extending uniformly across substantially the entire longitudinal length of said blade stock and said blade stock being easily divisible into a plurality of blade members; and

(b) notched angle stock for two opposing sides of said opening, said notched angle stock comprising at least one transverse portion and one face strip portion, said face strip portion having periodically spaced hook-shaped hinge elements formed therealong for receiving and, upon pivoting of the blade when received thereby, for slidingly engaging portions of said hook-shaped hinge portion of said blade stock, and said transverse portion having means for use in attaching said stock to an interior surface of said opening, said notched angle stock being easily cut and fastened within said opening.

4,185,658

ROTATING BLADE DAMPER

Francis J. McCabe, Doylestown, Pa., assignor to Prefco Products, Inc., Buckingham, Pa.

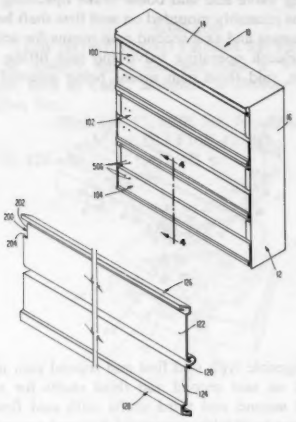
Continuation-in-part of Ser. No. 764,774, Feb. 2, 1977, Pat. No. 4,114,646, which is a continuation of Ser. No. 689,994, May 26, 1976, Pat. No. 4,081,173, also a continuation-in-part of Ser. No. 770,831, Feb. 22, 1977, Pat. No. 4,113,230 and Ser. No. 729,831, Oct. 4, 1976, Pat. No. 4,113,232, which are continuations-in-part of said Ser. No. 689,994, also a continuation-in-part, of Ser. No. 874,001, Jan. 31, 1978. This application Mar. 29, 1978, Ser. No. 891,331

Int. Cl.[2] F24F *13/14*

U.S. Cl. 137—601 **10 Claims**

1. In a damper comprising a frame, at least one blade, and rotation means for allowing selective rotational displacement of said blade between a closed and an open position with respect to said frame, the improvement wherein said frame comprises an inwardly depending flange having a plurality of

clearance notches defined therein and wherein at least one longitudinal edge of said blade is configured to form a hook-shaped portion, the tip of said hook-shaped portion being



configured to extend across said flange through at least one of said clearance notches when said blade is in the closed position.

4,185,659

SINGLE-HANDLE MIXING FAUCET

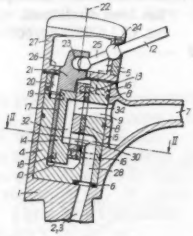
Georg Bernat, Menden, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Dec. 19, 1977, Ser. No. 861,579

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658023

Int. Cl.[2] F16K *11/06*

U.S. Cl. 137—625.17 **4 Claims**



1. A single-handle mixing valve for mixing hot and cold water sources and providing an output thereof, comprising:

a housing having a valve cartridge receiving bore, first and second inlet bores communicating respectively with said hot and cold water sources, and a discharge passage;

handle means; and

a cylindrical valve cartridge inserted into said receiving bore, said cartridge having a longitudinal axis and comprising:

a bushing having a valve chamber and first, second and third passages respectively communicating with said first and second inlet bores and said discharge passage;

a first valve plate fixably mounted within said valve chamber and having a first surface parallel to said longitudinal axis, and having first, second and third apertures communicating with said first, second and third passages, respectively;

a valve support plate connected to said handle means and extending into said valve chamber;

a second valve plate carried by said support plate and having a second surface parallel to said longitudinal axis and adapted to slidably engage said first surface, said second surface having a mixing recess; and

slidable pivot means for translating a displacement of said handle means in a first direction to a pivotal displacement of said support plate and for translating a displacement of said handle means in a second direction to a corresponding displacement of said valve support plate parallel to said longitudinal axis.

4,185,660

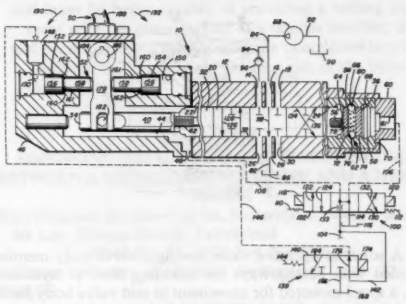
DIRECTIONAL CONTROL VALVE

James E. Faix, Pittsburgh, Pa., assignor to Consolidation Coal Company, Pittsburgh, Pa.

Filed Feb. 21, 1978, Ser. No. 879,906

Int. Cl.[2] F15B *13/043*

U.S. Cl. 137—625.64 **8 Claims**



1. In a directional control valve having a valve housing with a chamber therein,

inlet port means in said housing and opening into said chamber for supplying fluid from a source to said chamber,

a plurality of outlet ports in said housing and opening into said chamber,

a valve member slidably positioned in said valve chamber, said valve member having opposite end portions,

said valve member being operable to place said inlet port means and said outlet ports in fluid communication in a preselected arrangement with each other,

the improvement comprising,

fluid actuated pilot valve control means for conveying pressurized fluid to a selected one of said valve member end portions to move said valve member in said chamber in a first direction to a first end position to place in a first arrangement said inlet port means in fluid communication with said outlet ports and in a second direction to a second end position to place in a second arrrangement said inlet port means in fluid communication with said outlet ports,

detent means for locking said valve member in a selected one of said first and second end positions and thereby maintain the selected position of said valve member in the absence of fluid pressure applied to said selective end portion of said valve member,

a lever positioned in said valve housing and pivotally connected to said valve member for moving said valve member to a selective one of said positions in said chamber,

centering means having a predetermined length of travel between a first position and a second position for actuating pivotal movement of said lever to shift said valve member from either one of said first and second end positions in said chamber a distance corresponding to said predetermined length of travel of said centering means to a center position between said first and second end positions,

said detent means including means for locking said valve member in said center position,

fluid actuating means for energizing said centering means to move from said first position to said second position and

thereby pivot said lever to position said valve member in said center position, and

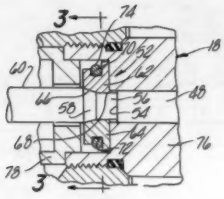
manually operated control means connected to said lever for pivoting said lever to shift said valve member to a position in said chamber where said detent means locks said valve member in a selected one of said first and second end positions and said center position.

4,185,661

SOLENOID OPERATED DIRECTIONAL VALVE WITH DETENT MECHANISM

Arthur W. Gill, Saline; Ronald L. Loup, Clarkston, and Curtis H. Day, Manchester, all of Mich., assignors to Double A Products, Manchester, Mich.

Filed Aug. 17, 1978, Ser. No. 934,419
Int. Cl.[2] F15B *13/044*; F16K *31/06*
U.S. Cl. 137—625.65 **7 Claims**



1. A solenoid operated valve having a valve body member provided with passageways for directing flow of hydraulic fluid, a spool mounted for movement in said valve body member and operatively associated with said passageways and movable to selected positions for controlling flow of hydraulic fluid through the passageways, a solenoid mounted on said valve body member in alignment with said spool, and a solenoid pin responsive to said solenoid for movement axially to shift said spool to a selected position, characterized in that a detent means is mounted in a fixed position with respect to said valve body member and positioned on said solenoid pin for retaining the latter against axial movement when the solenoid has moved said pin and the spool to said selected position of the spool, said solenoid pin has a groove extending around its circumference shaped to provide a cylindrical base and a ramp, said ramp being inclined toward said spool and extending from said base to the outer circumference of the solenoid pin, and said detent means includes a pair of split detent sleeves of similar shape having inner surfaces shaped to fit against the surfaces of the base and ramp of said groove and spring means urging said sleeves together, said spring means being a C-shaped spring seated on the radially outer surfaces of said split detent sleeves.

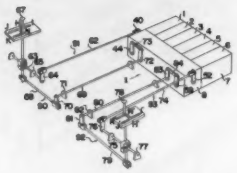
4,185,662

APPARATUS FOR ACTUATING OPERATING VALVE UNIT FOR WINCH

Mitsuyoshi Wada, Yamatotakada; Masami Hashimoto, Hirakata, and Teruo Nakahara, Kyoto, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jun. 13, 1977, Ser. No. 806,193
Claims priority, application Japan, Jun. 11, 1977, 51/67773
Int. Cl.[2] F16K *11/18, 31/46*
U.S. Cl. 137—636 **5 Claims**

1. An apparatus for actuating an operating valve unit for winch, said operating valve unit including a hook clutch operating valve, a hook brake operating valve, a boom clutch operating valve, a boom brake operating valve, a lifting clutch operating valve, and a lowering clutch operating valve; the apparatus comprising a casing, a first shaft fixedly supported within said casing, a second shaft rotatably supported within said casing, a third shaft rotatably supported with said casing, first cam means slidably and rotatably mounted on said first shaft for actuating said hook clutch operating valve and said hook brake operating valve, a second cam means slidably and rotatably mounted on said first shaft for actuating said boom clutch operating valve and said boom brake operating valve, third cam means rotatably mounted on said first shaft between said first cam means and said second cam means for actuating said lowering clutch operating valve and said lifting clutch operating valve, said third cam means being adapted to be



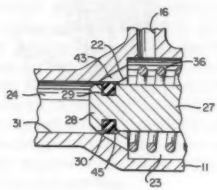
selectively engageable with said first and second cam means, means mounted on said second and third shafts for axially connecting said second and third shafts with said first and second cam means to slidably move said first and second cam means on said first shaft, respectively, and means mounted on said second and third shafts for rotatably connecting said second and third shafts with said first and second cam means, respectively.

4,185,663

CONDITION RESPONSIVE BY-PASS VALVE CONSTRUCTION

Stephen J. Stripling, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 800,300, May 25, 1977, Pat. No. 4,133,349.
This application Oct. 12, 1978, Ser. No. 950,818
The portion of the term of this patent subsequent to Jan. 9, 1996, has been disclaimed.
Int. Cl.[2] G05D *16/00*
U.S. Cl. 137—882 **10 Claims**



1. In a condition responsive by-pass valve construction having a housing means provided with an inlet and two outlets interconnected to said inlet, said housing means having an annular valve seat means disposed between one of said outlets and said inlet, said housing means carrying a movable valve member means for controlling the flow of fluid through said valve seat means to provide substantially a linear percentage by-pass flow between said inlet and said one of said outlets as said valve member means moves between a fully opened position thereof and a fully closed position thereof, said valve member means having a cylindrical portion interconnected to a frusto-conical portion that has a flat end surface, said cylindrical portion being adapted to sealing engage said annular valve seat means to fully close the same, said housing means carrying a condition responsive means for controlling movement of said valve member means, the improvement wherein said valve member means has groove means in said frusto-conical portion thereof to intersect with said flat end surface and

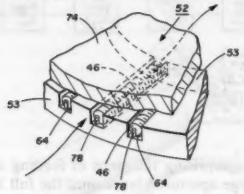
said cylindrical portion thereof for progressively bridging and unbridging said valve seat means to provide said substantially linear percentage by-pass flow.

4,185,664

LOW NOISE FLUID PRESSURE REDUCER

John M. Zabsky, Santa Ana, and John R. Marshall, Mission Viejo, both of Calif., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 17, 1978, Ser. No. 896,663
Int. Cl.[2] F16K *47/08*
U.S. Cl. 138—40 **10 Claims**



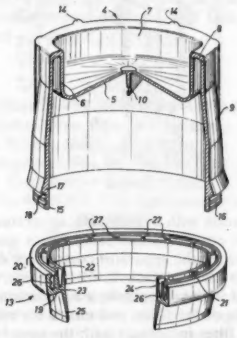
1. A fluid pressure reducer comprising in combination:
(a) body means adapted for position placement in a fluid flow conduit;
(b) at least one substantially line-of-sight opening of a predetermined cross sectional geometry extending through said body means between an inlet and outlet for communicating with flow conduit thereat; and
(c) a plurality of crest means contained in a generally transverse orientation longitudinally spaced apart in confining enclosed relation within said opening, said crest means being of a peripheral configuration in transverse section different than the geometrical surface configuration of said opening for cooperating with the opening walls thereat to define at least one longitudinal line-of-sight clearance space intervening therebetween and constituting a passage in which fluid flow can be conducted through said body means.

4,185,665

APPARATUS FOR THE PROTECTION OF TUBES PARTICULARLY TUBES FOR DRILLING PETROLEUM

Hughes J. Flimon, 10 Rue Jolly, 94160 St. Mandé, France

Filed Dec. 12, 1977, Ser. No. 859,737
Claims priority, application France, May 20, 1977, 77 15488; Dec. 1, 1977, 77 36222
Int. Cl.[2] F16l *55/10*
U.S. Cl. 138—89 **11 Claims**



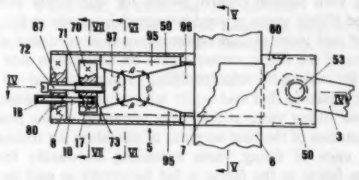
2. A sealing cover, for preventing ingress of fluid to a pipe element which has a screw-threading portion extending from one end thereof comprising:
a closure portion for closing the screw-threaded end; and
a cylindrical sleeve portion capable of providing a sealing engagement with the outer surface of a tubular element, said cylindrical sleeve portion having a first part formed integrally with the closure portion and a second part detachably connected with said first part;
said first part of said cylindrical sleeve portion having an externally profiled, annular, resilient extension remote from said closure portion;
said second part of said cylindrical sleeve portion having an inner annular resilient lip and at least an outer annular resilient lip surrounding said inner lip and coaxial with said inner lip, said inner and outer resilient lips defining an axially extending annular recess opening extending towards said first part of said cylindrical sleeve portion;
said inner lip being capable of providing a sealing engagement with the outer surface of a tubular member; and,
said recess having a profile which is complementary to the profile of the extension of the first part of the cylindrical sleeve portion.

4,185,666

ADJUSTING DEVICE IN THE CONNECTING PATH BETWEEN A SHED-FORMING DEVICE AND A HEDDLE FRAME

Kurt Heiniger, Horgen-Zuerich, Switzerland, assignor to Staeubli Ltd., Horgen-Zurich, Switzerland

Filed Jul. 14, 1978, Ser. No. 924,704
Claims priority, application Switzerland, Jul. 20, 1977, 8910/77
Int. Cl.[2] D03C *13/00*
U.S. Cl. 139—82 **12 Claims**



1. In an adjusting device in the connecting path between a pivotally supported jack lever of a shed-forming device and a heddle of a weaving machine, said adjusting device having an elongated adjusting member adjustably and lockably positioned on said jack lever and movable in two directions which are perpendicularly related with respect to one another, said adjusting member having a guideway thereon extending transversely to its longitudinal axis and receives said jack lever therethrough in one of said two directions, said adjusting member further having a swivel bearing for connection to said heddle, the improvement comprising wherein said adjusting member is constructed as a sleeve member having a U-shaped band arranged therein which grips around said jack lever on three sides, the ends of the legs of said band being connected to a block member, wherein between said block member and said jack lever plural wedges are arranged, said plural wedges being supported on a wall of said sleeve member when a rigid bracing occurs between said block member and said jack lever, and wherein first adjusting means on said block member is operatively connected to said wedges for rigidifying the position of said jack lever relative to said block member thereby preventing relative movement in said one direction, and second adjusting means is provided for varying the spacing between said end member and said block member for facilitating

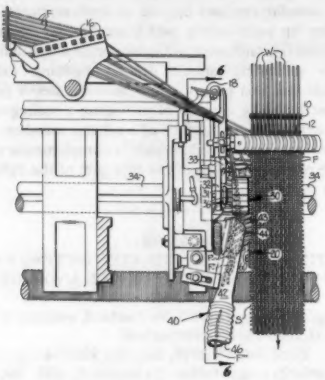
an adjusting of the position of said swivel bearing with respect to said jack lever and along said other of said two directions.

4,185,667

POSITIONING AND HOLDING MECHANISMS FOR FILLING YARNS IN A SHUTTLELESS LOOM

Edd H. Kendrick, Cleveland, Tenn., assignor to Rossville Mills, Inc., Rossville, Ga.

Filed May 17, 1978, Ser. No. 906,982
Int. Cl.[2] D03D *47/40, 49/70*
U.S. Cl. 139—302 **13 Claims**



1. In a shuttleless loom, preferably for weaving repeating patterned fabrics, including rapier means for inserting picks of selected ones of a plurality of filling yarns into the fabric, a filling yarn pattern control means for selectively presenting desired filling yarns at predetermined intervals at the feed-in side of said loom to said rapier means in accordance with the pattern of the fabric, cutter means on the feed-in side of said loom for cutting the selected filling yarn when received by said rapier means so that said rapier means inserts a free end of the selected filling yarn, and selvage trimming means positioned downstream of the beat-up point of the fabric for trimming the loose ends of filling yarns extending outwardly from the woven fabric as the fabric is fed forwardly in said loom; the improvement of means for positioning and holding the loose cut and uncut ends of filling yarns for trimming by said selvage trimming means and, preferably, for continuing to hold under tension the ends of those filling yarns on the feed-in side of said loom for which a repeat pick has not yet been called for in the repeating pattern of the fabric after cutting thereof by said selvage trimming means, said positioning and holding means comprising

means positioned between the beat-up point of the fabric and said selvage trimming means for gripping and positioning generally outwardly the cut and uncut ends of the filling yarns extending from the woven fabric after having been inserted therein by said rapier means, and

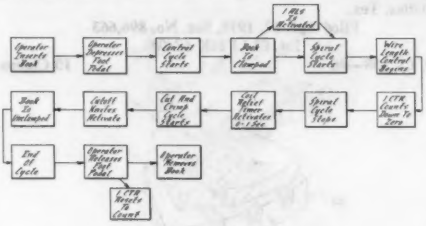
vacuum holding and removal means positioned subsequent to said gripping and positioning means and adjacent said selvage trimming means for receiving from said gripping and positioning means the outwardly positioned cut and uncut ends of the filling yarns extending from the woven fabric, for holding such filling yarns during cutting by said selvage trimming means, for preferably cooperating with said gripping and positioning means for continuing to hold under tension the cut ends of those filling yarns for which a repeat pick has not yet been called for after cutting thereof by said selvage trimming means, and for removing loose portions of the filling yarns after being completely cut off.

4,185,668

METHOD AND MEANS FOR INSERTING, CUTTING AND BINDING SPIRAL WIRE BINDERS

Larry M. Harbert, Pontiac, Mich., assignor to Hans Sickinger Co., Pontiac, Mich.

Filed Jun. 16, 1978, Ser. No. 916,160
Int. Cl.[2] B21F *11/00*
U.S. Cl. 140—92.4 **2 Claims**



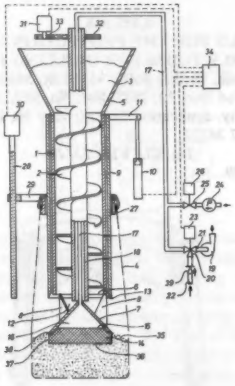
1. A method comprising the steps of feeding a spiral wire binder into an edge-apertured book until the full length of the binder has been fed, the configurations of the binder and edge apertures being such that energy storage due to coil windup will tend to occur during said feeding step, providing a timer set for the time needed after feed stopping to permit unwinding of said coil and release of said stored energy, stopping the feeding movement and at the same time initiating actuation of said timer, and cutting and inwardly crimping the opposite ends of the binder in response to running out of said timer.

4,185,669

METHOD AND APPARATUS FOR FILLING A RECEPTACLE WITH POWDER

Igor Jevakohoff, Montrouge, France, assignor to Alfa-Laval S.A., Bougival, France

Filed Jan. 16, 1978, Ser. No. 869,700
Claims priority, application France, Jan. 20, 1977, 77 01609
Int. Cl.[2] B65B *1/12, 1/26*
U.S. Cl. 141—59 **8 Claims**



1. In combination with a receptacle, apparatus for filling the receptacle with powder while removing a gaseous medium from the receptacle, the apparatus comprising means for feeding powder into the receptacle to fill the same, a filter having one side located in the receptacle, a suction source connected to the other side of the filter, and means for maintaining said one side of the filter in contact with the upper surface of the powder in the receptacle throughout said filling thereof, whereby gaseous medium is sucked from the powder filling the

receptacle while preventing powder from being sucked to said suction source, said feeding means including a vertical tube having at its lower end an outlet located in the receptacle, the feeding means also including a helical element in the tube, the apparatus comprising also means mounting the filter below said tube outlet with said other side of the filter facing the tube outlet.

4,185,670

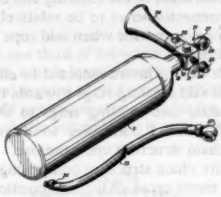
PORTABLE BICYCLE TIRE AIR SYSTEM

Ripley B. Sartell, Jr., 1882 E. Cornell Dr., Tempe, Ariz. 85283

Filed Nov. 13, 1978, Ser. No. 959,613

Int. Cl.[2] B65B *3/04;* B62J *3/00*

U.S. Cl. 141—94 **8 Claims**



1. Portable compressed air apparatus attachable to a vehicle for inflating tires of a bicycle, said apparatus comprising in combination:

a. a tank capable of safely storing compressed air at a high pressure;

b. a quick release bracket securely clamped to a frame member of the bicycle for enabling a bicyclist to quickly and easily remove said tank from said bracket;

c. an inlet valve for receiving high pressure compressed air from an automotive service station air hose, conducting said high pressure compressed air into said tank, and preventing said high pressure compressed air from escaping from said tank;

d. an outlet valve conveniently engageable with a valve of a tire of the bicycle, said outlet valve being operable to inflate the tire by allowing compressed air from said tank to be forced into the tire via the tire valve, and closable to prevent undesired escape of compressed air from said tank;

e. an air horn attached to said tank, said air horn including a manually operable valve for conducting compressed air from said tank into said air horn to cause said air horn to produce a loud, sustained blast of sound; and

f. adaptor means connecting said outlet valve and said inlet valve to a hole through a neck of said tank for conveying compressed air from said inlet valve into said tank and for conveying compressed air from said tank through said adaptor and out of said outlet valve.

4,185,671

ACCESSORY FOR ROUTING APPARATUS

Lawrence M. Cotton, New Bern, N.C., assignor to The Stanley Works, New Britain, Conn.

Continuation-in-part of Ser. No. 744,528, Nov. 24, 1976, Pat. No. 4,114,664, Continuation-in-part of Ser. No. 744,528, Nov. 24, 1976, Pat. No. 4,114,664. This application Sep. 18, 1978, Ser. No. 943,569

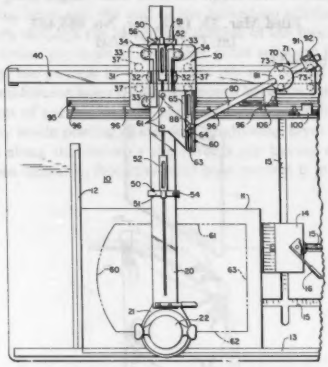
Int. Cl.[2] B27C *5/10*

U.S. Cl. 144—134 D **10 Claims**

1. An accessory for use with routing apparatus of the type having a base, means for securing a panel to be routed in predetermined position on the base, a rail extending parallel to one edge of a panel secured in said predetermined position, a bar extending over the base having means for mounting a router on the end thereof, and means for mounting the bar on the rail for longitudinal reciprocal movement and transverse rectilinear movement, said accessory comprising:

a. a radius arm adapted to be attached at one end to the bar;

b. mounting means mounting the radius arm for longitudinal reciprocal movement and pivotal movement and adapted to be mounted on the rail for movement along the rail;



c. adjustable stop means for limiting longitudinal reciprocal movement of the radius arm; and

d. adjustable stop means for limiting movement of said mounting means along the rail.

4,185,672

INTEGRATED TREE PROCESSING MILL

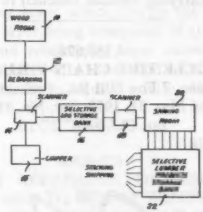
Rudy Vit, St. Nicolas, and Igor Fridrich, Ste. Foy, both of Canada, assignors to Reed Ltd., Toronto, Canada

Filed Dec. 4, 1975, Ser. No. 637,668

Claims priority, application United Kingdom, Feb. 6, 1974, 52890/74; Jan. 27, 1975, 3519/75; Canada, Sep. 17, 1975, 235680

Int. Cl.[2] B27B *1/00*

U.S. Cl. 144—312 **5 Claims**



1. A method of producing wood products from trees, including the steps of delimbing and debarking the trees, advancing the so-formed logs past a scanning station, scanning the logs to determine the respective diameter of the logs, passing the trees past a plurality of storage banks along a path, diverting the logs from the path into the respective storage banks classified according to its respective diameter, selectively withdrawing logs from the log storage banks, predetermining a longitudinal cutting pattern for the respective logs, squaring off the logs by means of chipping heads, advancing the squared off logs through a sawing station including saws, whereby the saws and chipping heads have been adjusted according to the predetermined cutting pattern for forming the logs into wood products, advancing the wood products so formed simultaneously in separate paths, edging the boards so formed where necessary, diverting the wood products so formed in separate wood

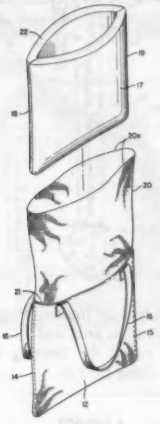
products storage banks according to respective size of the wood product formed.

4,185,673

UNITARY ARTICLE-CARRYING BAG AND CUSHION

Margaret M. Daniello, 3 Deerfield Dr., West Orange, N.J. 07052

Filed Mar. 13, 1978, Ser. No. 885,487
Int. Cl.[2] A45C *3/06*
U.S. Cl. 150—33 **1 Claim**



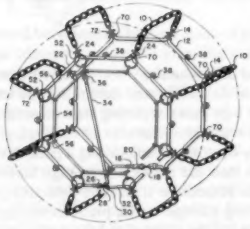
1. A hand carryable unitary article-carrying bag and cushion comprising:
(a) an outer cloth bag defining a cavity;
(b) a cushioned insert in the form of a bag comprised of foam rubber or sponge rubber having a thickness of from ½ to 1½ inches fitted within said cavity along the inside surface of said outer bag and being unsecured to said outer bag;
(c) a lining attached to said outer bag and overlying said cushioned insert; and
(d) a pair of carrying handles fastened to said outer bag.

4,185,674

VEHICLE TIRE CHAIN STRUCTURE

Victor S. Giannone, 7 Fox Hill Rd., Peekskill, N.Y. 10566

Filed May 31, 1978, Ser. No. 911,285
Int. Cl.[2] B60C *27/10*
U.S. Cl. 152—218 **9 Claims**



4. A vehicle tire chain structure comprising
a plurality of metal cross chains for positioning across the tread of the tire to enhance traction,
an inboard rope connector connected to the inboard ends of said cross chains by threading through the end links of the cross chains and including releasable attachment elements at the ends of the inboard rope connector for attaching the ends to one another,
an outboard rope connector connected to the outboard ends of said cross chains by threading through the end links of the cross chains,
said outboard rope connector including an attachment element at one end and a second attachment element connected near the other end thereof for attachment to said first attachment element,
a separate floating ring girdling the entering and departing sides of said outboard rope connector at each connection of said rope connector to said end links of said cross chains,
said floating rings being substantially circular and having a substantially larger inner cross section than the combined cross sectional areas of the entering and departing sides of said rope connector so as to be relatively freely slidable upon said rope connector when said rope connector is not under tension,
and a spreader device interconnected to all of said floating rings to pull said floating rings towards the center of the wheel to cause said floating rings to shorten and thus tighten said inboard connector to thereby tighten the entire tire chain structure upon the tire.

9. A vehicle tire chain structure comprising
a plurality of metal cross chains for positioning across the tread of the tire to enhance traction,
an inboard rope connector connected to the inboard ends of said cross chains by threading through the end links of the cross chains and including releasable attachment elements at the ends of the inboard rope connector for attaching the ends to one another,
an outboard rope connector connected to the outboard ends of said cross chains by threading through the end links of the cross chains,
said outboard rope connector including an attachment element at one end and a second attachment element connected near the other end thereof for attachment to said first attachment element,
a plurality of removable crown loop length adjustment devices connected to both said inboard rope connector and said outboard rope connector at positions intermediate to the connections of said rope connectors to the ends of said cross chains,
each of said crown loop devices comprising an open ended cylinder member girdling a U-loop of the associated rope connector and a narrow retainer member spanning across the top of said cylinder member,
said retainer member being positioned under the end of the U-loop of said rope connector girdled by said cylinder member to maintain said crown loop device upon the U-loop when said rope connector is under tension,
said crown loop device being easily removable from said rope connector when the tension is relieved by raising the U-loop in said cylinder member and then moving said retainer member out of the end of the loop and then sliding the loop out of said cylinder member to permit the loop to open to thus lengthen the rope connector.

4,185,675

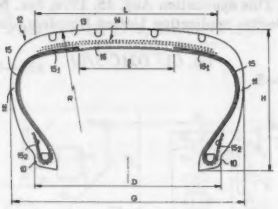
VEHICLE TIRES

Henri Greiner, Conflans Ste. Honorine, and Claude A. Lefaucheur, Paris, both of France, assignors to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes, France

Filed Feb. 22, 1978, Ser. No. 880,173
Int. Cl.[2] B60C *5/08*
U.S. Cl. 152—354 R **4 Claims**

1. A vehicle tire having a low cross-section in which the ratio of height over width is less than 0.8, a crown including a tread and a crown belt formed from at least two plies made of cords which are oriented in directions which intersect at small angles, beads, side walls which are each reinforced by at least

one strong half-carcass ply which extends from a respective said bead to a lateral region of said crown, said half-carcass ply being interrrupted beneath said crown belt and being separated between the lateral regions of said crown by a distance which



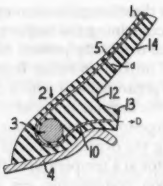
is equal to at least one third of the width of said crown belt, and a supporting layer which interconnects said half-carcass plies between the lateral regions of said crown, which has a strength of less than 50 daN per centimeter of width for an extension of 10% and whose elastic extensibility is at least 10%.

4,185,676

PNEUMATIC TIRE

Antoine Raluy, Vertaizon, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Oct. 20, 1977, Ser. No. 844,043
Claims priority, application France, Oct. 25, 1976, 76 32160
Int. Cl.² B60C *9/02, 15/02*
U.S. Cl. 152—362 R **4 Claims**



1. A pneumatic tire of large size used off the highway having a tread extended on each side by a sidewall terminating in a bead with a bead ring and having a carcass reinforcement with sidewall portions and porions turned upwards around said bead ring, characterized by the fact that the portions of said carcass reinforcement which have been turned upwards around the bead rings are spread towards the outside of the tire, diverge from the sidewall portions of the carcass reinforcement and are embedded in an annular portion of the tire which protrudes from an outer lower portion of the corresponding sidewall.

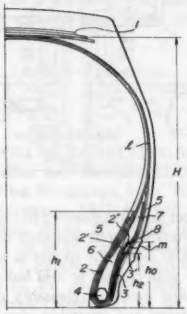
4,185,677

REINFORCED CONSTRUCTION OF BEAD PORTIONS OF RADIAL TIRES FOR HEAVY LOAD VEHICLES

Kenichi Motomura, Higashi-Murayama; Mitsuhisa Yahagi, Sayama, and Toshiyuki Sogi, Higashi-Yamato, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Nov. 30, 1977, Ser. No. 856,068
Claims priority, application Japan, Mar. 31, 1977, 52-36478
Int. Cl.² B60C *15/06*
U.S. Cl. 152—362 R **8 Claims**

1. In a pneumatic tire comprising at least one carcass ply wrapped around bead cores from the inside toward the outside thereof to form loops and turned-up portions, respectively, and composed of radially or semi-radially directed cords, a rubber stiffener interposed between the carcass ply and its turned-up portion and extending radially outwardly from the bead core, said rubber stiffener being substantially triangular in section, the improved reinforced construction of bead portions of radial tires for heavy load vehicles, comprising a first reinforcing layer composed or organic fiber cords and a second reinforcing layer composed of metal cords, said first reinforcing layer being substantially continuously extended from an axially outward point higher than both the upper end of said second reinforcing layer and the end of the turned-up portion of the carcass ply through the lower side surface of the loop portion of said carcass ply to an axially inner point adjacent the inner surface of the portion of said carcass ply not turned up, said second reinforcing layer being interposed between the turned-up portion of the carcass ply and said first reinforcing layer, the axially inside portion of said first reinforcing layer which is disposed along the inside of the carcass ply having an upper end whose height h_1 from the bead base portion is given by



$$h_1 = (0.8 \text{ to } 2.5)h_0$$

where h_0 is a height of the end of the turned-up portion of the carcass ply from the bead base portion and having at least two layers whose cords cross with one another and are inclined on a circle formed by the end of the turned-up portion of the carcass ply with respect to the radial direction of the tire by an angle between 40° and 75°, and the axially outside portion of said first reinforcing layer which covers the outside of the second reinforcing layer being composed of at least one layer wherein said second reinforcing layer extends radially inwardly and is terminated at a lower end in the region of the bead heel portion so as to be secured axially outside of the bead core.

4,185,678

METHOD AND APPARATUS FOR ASSEMBLYING SPOKES TO RIM OF WHEEL

Makoto Nagatomo, No. 1-15-16, Minami-Ogikubo, Suginami-ku, Tokyo, Japan

Filed May 12, 1976, Ser. No. 685,931
Claims priority, application Japan, May 14, 1975, 50/57670
Int. Cl.² B21K *1/34*
U.S. Cl. 157—1.55 **20 Claims**

1. An apparatus for assembling spokes extending outwardly from a hub to a wheel-rim comprising:

(a) a base structure;

(b) a shaft rotatably supported in said base structure with a portion extending upwardly from said base structure;

(c) clamping means attached to the end of said upwardly extending shaft portion for clamping a hub containing outwardly extending spokes;

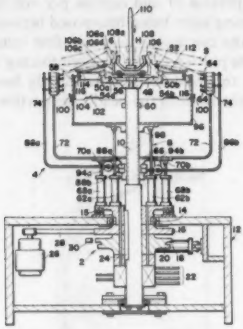
(d) driving means for rotating the clamped hub so that the spokes extend centrifugally outwardly from the hub in a predetermined pattern during the rotation; and

(e) orienting means for releasably engaging the spokes in said

predetermined pattern during the rotation of said hub and for arranging the spokes in a predetermined relationship with respect to said hub, said orienting means including:

(1.) a plurality of rings separately and independently rotatable about said shaft;

(2.) a plurality of receiving members extending inwardly from the inner surface of each of said plurality of rings for releasably engaging outer ends of the centrifugally outwardly extended spokes;



(3.) arm member means connected to each said plurality of rings and rotatable about said shaft through a predetermined angle to orient the spokes in said predetermined relationship with respect to said hub; and

(4.) a cylindrical member releasably connected to said clamping means and rotatable about said shaft, said cylindrical member being axially movable along said shaft and including means for securing the spokes oriented in said predetermined relationship.

4,185,679

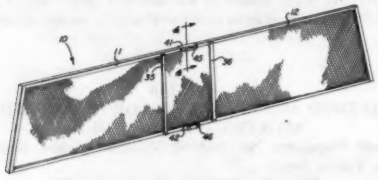
SUN SHADE SCREEN

Jimmie E. Weir, 1210 Grand Ave., Phoenix, Ariz. 85007

Continuation-in-part of Ser. No. 819,338, Jul. 27, 1977. This application Nov. 27, 1978, Ser. No. 964,260

Int. Cl.² E06B 3/12, 9/00

U.S. Cl. 160—231 A **7 Claims**



1. In a sun shade screen of the type having a hollow frame, and having a flexible sun screen material surrounded by and attached to said frame, the improvement comprising:

(a) a hollow frame surrounding and attached to a flexible sun screen material, said frame formed of two opposing frame members having opposing open hollow frame sections in registration with and abutting each other; and

(b) said opposing open hollow frame members alligned by flexible inserts extending into opposing hollow frame sections to maintain registration of said opposing sections and to permit said frame and said flexible material to be folded upon itself.

(c) said inserts slidably positioned in, and being completely enclosed within, said abutting frame section when said frame is not folded.

4,185,680

PROCESS FOR PRODUCING USEFUL CONCENTRATED SLURRIES FROM WASTE MATERIAL

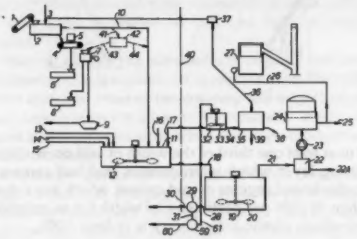
Victor Lawson, Fetcham, England

Continuation-in-part of Ser. No. 759,000, Jan. 13, 1977, abandoned. This application Aug. 15, 1978, Ser. No. 933,811

Claims priority, application United Kingdom, Jan. 28, 1976, 3408/76

Int. Cl.² D21C 5/02

U.S. Cl. 162—5 **6 Claims**



1. A process for the production of a concentrated slurry containing fibers suitable for use in the production of a self-binding product selected from the group consisting of paper, board and fuel, with the contemporaneous consumption of domestic refuse containing both organic and inorganic materials and of a sewage sludge, which process comprises:

diluting the domestic refuse with water and breaking up the refuse;

separating off from the diluted, broken-up refuse, the larger pieces of refuse containing the majority by weight of the inorganic material originally present in the refuse;

passing the diluted, broken-up refuse from which the larger pieces have been separated and which contains the majority by weight of the organic material originally present in the refuse, to a digestor containing microorganisms capable of assimilating the organic material present and maintaining said digestor at a temperature effective for producing a hydrocarbon combustible gas selected from the group consisting of methane, propane, and butane;

passing to the digestor a sewage sludge;

allowing the microorganisms to feed on the sewage sludge and on said diluted, broken-up refuse from which the larger pieces have been separated and to produce said hydrocarbon combustible gas, the contents of the digestor being agitated to produce a uniform dilute slurry;

burning part of the resulting combustible gas to provide heat required to maintain the contents of the digestor at the required operating temperature;

withdrawing a dilute slurry from the digestor, said slurry containing long fibers of a length sufficient to produce a selfbinding product and fibers shorter than said long fibers;

dewatering the dilute slurry withdrawn from the digestor in a manner such that the majority of long fibers are retained in the resulting first concentrated slurry with the long fibers entwined with each other, there also being produced a more dilute slurry;

withdrawing the first concentrated slurry from the dewatering stage and drying said long fibers to produce said self-binding product;

concentrating the said more dilute slurry to obtain a second concentrated slurry containing said shorter fibers and other non-fibrous solid material, and to obtain a weak aqueous slurry;

withdrawing the second concentrated slurry which is suitable for use in or as a nutrient-bearing solid conditioner or animal feedstuff; and

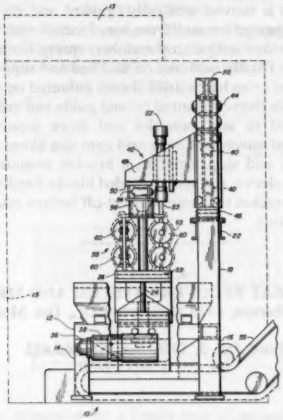
recycling said weak aqueous slurry to the digestor.

4,185,681

CERAMIC KNOCK-OFF APPARATUS FOR REMOVING CERAMIC FROM INVESTMENT CASTING MOLDS

Thomas A. Church, Woodridge, and Theodore W. Johnson, Wheaton, both of Ill., assignors to Conveyersmith, Inc., La-Grange, Ill.

Filed Jun. 22, 1978, Ser. No. 918,107
Int. Cl.[2] B22D *29/00*
U.S. Cl. 164—154 24 Claims



1. An apparatus for removing ceramic coatings from investment casting molds, comprising:

rotatable turntable means having a receptacle for receiving and holding the investment casting mold;

carriage means slidably mounted for movement to an engageable position over the top of the investment casting mold;

clamp means mounted on said carriage means and positioned to engage the top of the investment casting mold, said clamp means actuatable to clamp the investment casting mold to the turntable means;

hammer means mounted on said carriage means arranged to operate on the investment casting mold when the turntable means rotates to align the respective arms of the investment casting mold with said hammer means;

power means for supplying operative power to raise and lower said carriage means, to cause said hammer means to break off the ceramic coating from the respective arms of the investment casting mold, to cause the clamp means to clamp the investment casting mold to the turntable means, and to cause said turntable means to rotate; and

control means for causing said power means to supply power to raise and lower said carriage means, clamp said clamp means, and rotate said turntable means so that said hammer means is aligned and engaged with the investment casting mold and operated to break off the ceramic coating therefrom.

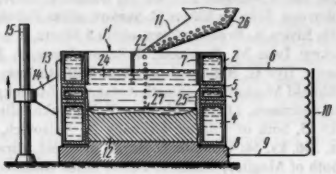
4,185,682

ELECTROSLAG REMELTING AND SURFACING APPARATUS

Georgy V. Ksendzyk, bulvar Lesi Ukrainki, 2, kv. 18; Isidor I. Frumin, ulitsa Bolshaya Zhitomirskaya, 17, kv. 6, and Vladimir S. Shirin, ulitsa Anri Barbjusa, 22/26, kv. 106, all of Kiev, U.S.S.R.

Filed Jun. 23, 1977, Ser. No. 809,311
Int. Cl.[2] B22D *27/02*
U.S. Cl. 164—252 2 Claims

1. In an electroslag remelting and surfacing apparatus mould comprising at least two vertically aligned sleeves forming an opened-end cavity with electrically insulative means separating the top sleeve from the next adjacent sleeve, said top sleeve having a substantially vertically extending slot filled with an electrically insulating material, means electrically connecting



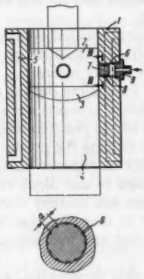
said top sleeve to a power source enabling said top sleeve to serve in the electroslag process as both an electrode and a means for creating an electromagnetic force field causing a unidirectional stable rotary motion of the molten slag.

4,185,683

ELECTROSLAG REMELTING MOULD

Boris I. Medovar, ulitsa Anri Barbjusa, 22/26, kv. 109; Viktor L. Artamonov, ulitsa Shumskogo, 8, kv. 90; Alexei G. Bogachenko, ulitsa Miljutenko, 15/2, kv. 141; Jury P. Shtanko, ulitsa Dobrokhotova, 26, kv. 53; Oleg P. Bondarenko, ulitsa Kreschatik, 15, kv. 34, all of Kiev; Konstantin S. Eltsov, ulitsa Tbilisskaya 15, kv. 7, Zaporozhie; Nikolai V. Stetsenko, ulitsa Patrioticheskaya 32, kv. 25, Zaporozhie; Sergei S. Popov, ulitsa 40 let Sovetskoi Ukrainy, 51, kv. 49, Zaporozhie; Gary P. Kaganovsky, ulitsa Bocharova 8, kv. 48, Zaporozhie, and Albert N. Korotkov, ulitsa Lenina, 228, kv. 2, Zaporozhie, all of U.S.S.R.

Filed Jan. 18, 1978, Ser. No. 870,516
Int. Cl.[2] B22D *21/02, 27/02*
U.S. Cl. 164—252 4 Claims



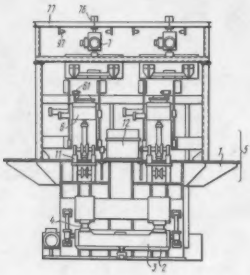
1. An electroslag melting mould comprising a wall defining a cavity having zones for containing slag and metal pools and a solidifying ingot, said wall being formed with at least one opening communicating with the cavity in the zone of the slag pool; and an insert positioned within the opening in said wall so that said wall and said insert have contacting surfaces, at least one of said contacting surfaces being provided with longitudinal through grooves bounded by the other contacting surface and forming ducts for feeding gas into the slag pool zone, said insert having at least two parts, one coaxially positioned within the other so that said parts have contacting surfaces, at least one of said contacting surfaces of said parts being provided with longitudinal grooves bounded by the other contacting surface of the same pair and, said grooves forming ducts for feeding gas into the slag pool zone.

4,185,684

MACHINE FOR CONTINUOUS CASTING BY DRAWING-UP

Jury G. Zabava, ulitsa Romena Rollana, 7, kv. 61; Rem N. Kogan, ulitsa Njutona, 127, kv. 21; Dzhan A. Lurie, pereulok I.Dubovogo, 2, kv. 3; Viktor G. Surkov, ulitsa Tobolskaya, 50, kv. 31; Elvira A. Bratslavskaya, ulitsa 8 Marta, 5, kv. 1, all of Kharkov; Ivan M. Barabash, 2 Begovoi proezd, 8, kv. 32, Moscow; Ilya G. Rodnyanksy, ulitsa Bibliotechnáya, 16, kv. 33, Khimki Moskovskoi oblasti; Antanas A. Maljukyavichjus, ulitsa Zhirmunu, 111, kv. 24; Egor T. Voitenko, ulitsa Parko, 22, kv. 5, both of Vilnjus; Gennady A. Anisovich, prospekt Mira, 256, kv. 54; Vladimir F. Bevza, prospekt Mira, 256, kv. 40, both of Mogilev; Vadim I. Tutov, ulitsa Knorina, 10b, kv. 51; Valentin A. Grinberg, ulitsa Gorkogo, 8, kv. 7, both of Minsk; Evgeny I. Marukovich, prospekt Jubileiny, 5, kv. 77, Mogilev, and Nikolai A. Senkin, ulitsa Korzhenevskogo, 17, kv. 45, Minsk, all of U.S.S.R.

Filed Mar. 23, 1978, Ser. No. 889,412
Int. Cl.[2] B22D *11/126, 11/128*
U.S. Cl. 164—263 **7 Claims**



1. A machine for continuous casting by drawing-up comprising:

a bed;

a lifting table mounted on said bed for upward and downward movement;

a metal supply means mounted on said table;

at least two molds fixedly mounted on said bed and arranged above said metal supply means;

drawing-up means for pulling out the continuous-cast product from said molds, comprising: a block of pinch rolls mounted on said bed to pinch said hollow continuous-cast product, thereby moving the product upwardly in a vertical direction only; a reducer secured on said bed and mechanically linked to said block of pinch rolls, enabling said rolls to rotate, and thereby drawing-up said continuous-cast product in one direction only; and an actuator secured on said bed and mechanically linked to said reducer;

means for cutting said continuous-cast product to lengths comprising: guides fixedly mounted on said bed; a housing mounted on said guides for reciprocal movement therealong; an actuator of synchronous movement secured on said bed and mechanically linked to said housing to impart reciprocal motion to the housing slidingly along said guides; a device for gripping said hollow continuous-cast product including guides mounted within said housing, a pair of gripping blocks by means of which said cut-off means is pressed against said hollow continuous-cast product, said blocks being movably mounted on said guides, an actuator, and a clamp member with wedge-shaped sides connected to and actuated by said actuator to be brought into interaction with said gripping blocks thus operated to grip said hollow product being cast; a hollow sleeve mounted within said housing and rotatable about its axis, said sleeve being arranged coaxially with said hollow continuous-cast product passing therethrough and with said mold; a drive mechanically linked to said hollow sleeve and imparting rotation to the sleeve about its axis; and a cutting tool mounted on said sleeve to cut said hollow continuous-cast products to lengths, the products moving upwardly and said sleeve rotating about an axis in alignment with the axis of said hollow product being cast; and

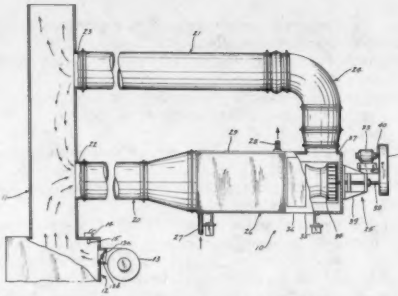
a manipulator mounted on said bed above said cut-off means and comprising: a drive means secured to the upper part of said bed; a cross bar connected to said drive means by which it is moved vertically upward and downward; a guide mounted on said cross bar, formed with a cam slot and provided with a stop member; spring-loaded support members fixedly mounted on said bed and supporting said guide and cross bar; a drive means mounted on said guide; a movable sleeve mounted on said guide and mechanically connected to said cam slot and drive means enabling reciprocal movement over said cam slot along said guide as far as said stop member; a bracket mounted on said movable sleeve; and spring-loaded blocks fixedly mounted on said bracket to clamp said cut-off hollow continuously cast product.

4,185,685

WASTE HEAT RECOVERY SYSTEM AND METHOD

Elwood C. Giberson, 4110 Greenwood Dr., Des Moines, Iowa 50312

Filed Jan. 3, 1978, Ser. No. 866,452
Int. Cl.[2] F28D *15/00*
U.S. Cl. 165—1 **6 Claims**



1. A waste heat recovery system for recovering heat from exhaust gases flowing through an exhaust stack from a source of heat, said system comprising:

(a) heat exchanger means having an inlet and an outlet,

(b) first conduit means connected to the inlet of said exchanger means and to said exhaust stack,

(c) second conduit means connected to the outlet of said exchanger means and to said exhaust stack,

(d) means associated with at least one of said first and second conduit means for moving at least a portion of said exhaust gases from said exhaust stack through one of said conduit means and said exchanger means and returning said portion to the stack through the other of said conduit means,

(e) means for supplying combustion air to said source of heat, and

(f) means for actuating the means for moving said portion of exhaust gases to an "on" position in response to a preselected volume of air provided to the source of heat by said supply means.

5. A method for recovering waste heat from exhaust gases flowing through an exhaust stack from a source of heat, said method comprising the steps of:

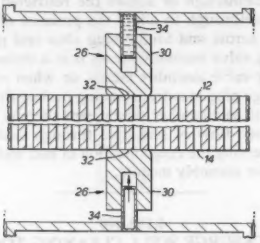
(a) providing a bypass conduit means having an inlet and an outlet connected with said exhaust stack for flow of exhaust gases through said bypass means,

(b) disposing a heat exchanger means in said bypass means,
(c) moving substantially all of the exhaust gases from said source of heat through said bypass means; and then
(d) concurrently drawing a portion of the exhaust gases discharged to said exhaust stack from said bypass means into said bypass means for a return flow therethrough.

4,185,686
SEALING APPARATUS FOR ROTARY HEAT EXCHANGERS

Joseph K. Pereira, Kingston-upon-Thames, England, assignor to British Steel Corporation, London, England

Filed Oct. 26, 1977, Ser. No. 845,671
Int. Cl.[2] F28D *19/00*
U.S. Cl. 165—7 **20 Claims**

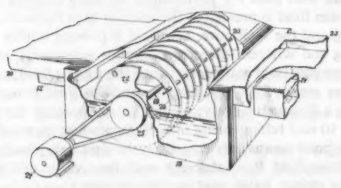


1. Sealing apparatus for a rotary heat exchanger of the regenerative type, wherein the heat exchanger includes a rotatable matrix having two opposed end faces, each of said end faces having a pair of gas passages adjacent thereto with openings aligned therewith, wherein the sealing apparatus is positioned at at least one of the end faces and prevents leakage of gas between the passages aligned with the end face at the interface of the passages and end face; the sealing apparatus comprising:
a plurality of sealing blocks arranged in end-to-end relation and being moveable with respect to one another to provide a flexible sealing means extending along the interface of the passages and end face, each block having a channel therethrough and a ceramic shoe for bearing in sealing relation upon the end face, and
guide means extending into each of the channels for laterally restraining the blocks, the guide means including a passageway therethrough for conveying cooling fluid for cooling the blocks.

4,185,687
COOLING TOWER

Richard F. Stockman, Friendship, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Feb. 21, 1978, Ser. No. 879,821
Int. Cl.[2] F28D *19/00*
U.S. Cl. 165—8 **7 Claims**

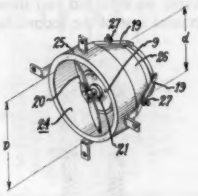


1. A cooling tower for the transfer of heat between a hot liquid and a cool gas including a housing having inlet and outlet ports for the hot liquid adapted to maintain a predetermined depth of hot liquid in said housing, bearing means defining an axis of rotation that lies above the surface of said liquid, a horizontal shaft mounted on said bearing means, a pair of disc members axially mounted on said horizontal shaft and axially spaced apart to provide a spacing therebetween, a plurality of annular heat absorbent elements intermediate the disc members lying in said spacing concentrically spaced from said horizontal shaft, and support means extending axially between disc members adapted to support the annular heat absorbent elements comprising a series of telescopic rod segments that together form composite rods extending between discs to simultaneously separate said annular elements and provide a support therefor.

4,185,688
COOLER FAN NOISE SUPPRESSOR

Alfons M. Wiater, Adams, Mass.; Nicholas L. Paternoster, Erie, Pa., and Walter J. Pasko, Lee, Mass., assignors to General Electric Company, N.Y.

Filed Dec. 22, 1977, Ser. No. 863,225
Int. Cl.[2] F28F *9/24*
U.S. Cl. 165—122 **5 Claims**



1. A forced air-cooling system of the type consisting of a heat exchanger with a fan assembly mounted on the heat exchanger by a plurality of support struts extending between said heat exchanger and said fan assembly comprising:
a noise suppressor attached to the heat exchanger by said plurality of support struts and at least partially encompassing the fan for providing an antiresonant chamber for cooling air being drawn through the heat exchanger, said noise suppressor consisting of an air transfer duct having a circular inlet opening for receiving said cooling air and a circular outlet opening for expelling said cooling air, the ratio of the diameter of the outlet to the diameter of the inlet opening being from 0.5 to 0.9 for suppressing the fan noise without interfering with the cooling air flow.

4,185,689
CASING BRIDGE PLUG WITH PUSH-OUT PRESSURE EQUALIZER VALVE

Allen E. Harris, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 5, 1978, Ser. No. 939,532
Int. Cl.[2] E21B *23/00*
U.S. Cl. 166—133 **2 Claims**

1. A bridge plug for use in a wellbore to control the flow of fluid therethrough, said bridge plug comprising:
a bridge plug mandrel having a first bore terminating in an annular seat, a second bore terminating in a chamfered annular seat, and a central bore therethrough;
an upper slip support slidable on said bridge plug mandrel;
an upper slip wedge installed on said bridge plug mandrel;
a first plurality of slips, each slip of said first plurality of slips having one end retained by said upper slip support while the other end slidably engages said upper slip wedge;
an elastomeric packer assembly installed on said bridge plug mandrel;
a lower slip wedge installed on said bridge plug mandrel;

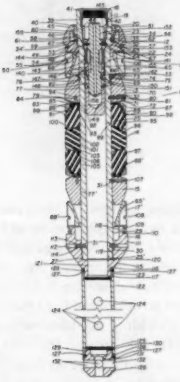
a lower slip support having a bore therethrough aligned with the central bore in said bridge plug mandrel and secured to one end of said bridge plug mandrel;

a second plurality of slips, each slip of said second plurality of slips having one end retained by said lower slip support while the other end slidably engages said lower slip wedge;

catcher tube means having one end thereof secured to said lower slip support in aligned relationship with the bore in said lower slip support, having plug means installed in the other end thereof, and having a plurality of holes therein; and

plug valve assembly means installed in the second bore and central bore of said bridge plug mandrel comprising:

sleeve means retained in the second bore and central bore of said bridge plug mandrel, said sleeve means having the lower end thereof closed, having a portion of the exterior surface thereof in sealing engagement with the central bore of said bridge plug mandrel with the remaining portion of the exterior surface of said sleeve means above the portion of the exterior surface in sealing engagement with the central bore of said bridge plug mandrel including a plurality of collet finger means, each collet finger means having one end secured to said sleeve means with the other end having an enlarged end thereon engaging the chamfered annular seat of the second bore of said bridge



plug mandrel, and with the remaining portion of the exterior surface of said sleeve means below the portion of the exterior surface in sealing engagement with the central bore of said bridge plug mandrel having a smaller diameter than the central bore of said bridge plug mandrel thereby creating an annular space between the remaining portion of the exterior surface of said sleeve means and the central bore of said bridge plug mandrel, and having a plurality of passage means allowing communication between the remaining portion of the exterior surface of said sleeve means and the bore of said sleeve means; and

plug means retained within the bore of said sleeve means, said plug means comprising:

a lower portion having substantially the same diameter as the bore of said sleeve means;

an intermediate portion having a smaller diameter than the diameter of the bore of said sleeve means thereby creating an annular space between the intermediate portion of said plug and the bore of said sleeve means;

an upper portion having a portion of the surface thereof substantially engaging the heads of said collet fingers with the remaining portion thereof having a smaller diameter than the portion of the surface substantially engaging the heads of said collet fingers;

an axial bore allowing communication between the end surfaces of said plug means; and

a plurality of passage means located in the intermediate portion of said plug means allowing communication between the exterior surface of the intermediate portion of said plug means and the axial bore of said plug means,

said plug means being operable between a first position where said plug means sealingly engages said bore in said sleeve means blocking said plurality of passage means and a second position where said plug means permits communication between the bore of said sleeve means and the central bore of said bridge plug mandrel via said plurality of passage means in said sleeve means; and

means for retaining said plug means in said first position in said sleeve means blocking said plurality of passage means

whereby said plug valve assembly means when installed in said bridge plug mandrel either prevents the flow of said fluid therethrough or allows the restricted flow of said fluid therethrough to allow the pressure of said fluid to equalize across said bridge plug after said plug means of said plug valve assembly means is in a second position in said plug valve assembly means, or when removed from said bridge plug mandrel by being pushed therethrough is retained in said catcher tube means thereby allowing the unrestricted flow of said fluid through said bridge plug and preventing the contamination of said wellbore by said plug valve assembly means.

4,185,690

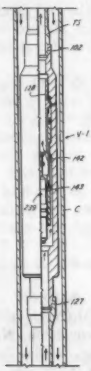
BACKSURGE WELL CLEANING TOOL

Charles W. Kinney, Houston, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed Jun. 12, 1978, Ser. No. 915,041

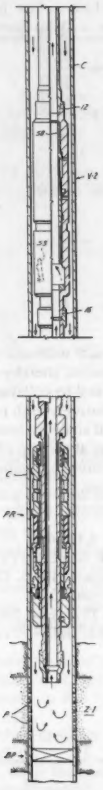
Int. Cl.[2] E21B *33/10, 21/00*

U.S. Cl. 166—183 **6 Claims**



1. A valve apparatus disposable in a tubing string in a subterranean well bore for performing pressure surging operations, wherein fluid is present in the annular area between the tubing string and the well bore, and fluid is present within the tubing string and wherein there is means for selectively pressurizing the annulus fluid and pressurizing the tubing fluid, comprising: packer means for separating the annulus fluid from the tubing fluid; a first valve body; means for connecting the first valve body to said tubing string in communication therewith; flapper valve head means carried within the first valve body normally blocking fluid flow through said first valve body and said tubing string; valve seat means for selective sealing engagement with said flapper valve head means carried on said first valve body; a first piston carried by the first valve body responsive to pressurization of the annulus fluid to shift said flapper valve head means away from sealing engagement with said valve seat means to allow fluid flow through said first

valve body; a second tubular body having a central bore; means for connecting the second tubular body to said tubing string in communication therewith; first lock means within said second tubular body; seal means selectively sealingly lockable within said second tubular body and having second lock means carried thereon, said seal means preventing fluid flow through said central bore; a fluid by-pass on said second tubular body; second piston means carried on said second tubular body and



selectively sealingly covering said bypass to prevent fluid communication through said by-pass, said second piston means being shiftably responsive to pressurization of the tubing fluid whereby said second piston means is shifted in a first direction to a first position to open said fluid bypass means and permit fluid communication therethrough; and a cylindrical tubular air chamber located between said first and second valve bodies and communicating with said valve bodies.

4,185,691

SECONDARY OIL RECOVERY METHOD AND SYSTEM

E. Sam Tubin, 4419 Fulton Ave., Sherman Oaks, Calif. 91403, and Stewart Tongret, Santa Monica, Calif., assignors to E. Sam Tubin, Sherman Oaks, Calif.

Continuation-in-part of Ser. No. 830,894, Sep. 6, 1977, Pat. No. 4,127,169. This application Apr. 24, 1978, Ser. No. 898,709

Int. Cl.[2] E21B *33/127, 43/24*

U.S. Cl. 166—250 **29 Claims**

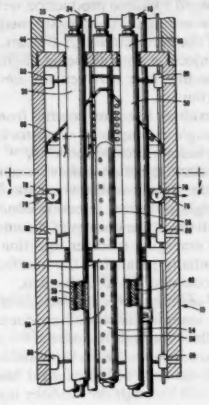
1. A novel oil well tool comprising:

an external elongated shell adapted to be received within a bore hole traversing an oil field;

means for introducing liquid water into said shell in situ within the bore hole in heat transfer proximity to a pay zone of the oil field;

within said shell, electrically powered means for transforming said liquid water into at least one jet of high pressure steam directed downward from said shell in said bore hole.

19. The method of stimulating the flow of oil in a formation traversed by a bore hole to cause the migration of oil into the bore hole where it is recoverable to the surface by conventional techniques, comprising the steps of:



introducing high pressure liquid water into a vessel in situ within the bore hole in heat transfer proximity to the pay zone of said formation;

superheating said liquid water within the vessel by passing an electrical current through the water between at least two electrically conductive surfaces as the water flows therepast; and

permitting the superheated liquid water to pass downwardly from the vessel into the bore hole adjacent to the pay zone through at least one orifice at the bottom of the vessel and there to immediately flash to high pressure steam.

4,185,692

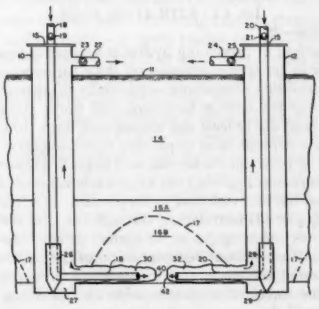
UNDERGROUND LINKAGE OF WELLS FOR PRODUCTION OF COAL IN SITU

Ruel C. Terry, Denver, Colo., assignor to In Situ Technology, Inc., Denver, Colo.

Filed Jul. 14, 1978, Ser. No. 924,849

Int. Cl.[2] E21B *43/24*

U.S. Cl. 166—257 **14 Claims**



1. A method of linking two spaced apart production wells

drilled through an underground coal seam wherein the linkage is accomplished substantially at the bottom of the underground coal seam in preparation for producing the coal in situ, comprising the steps of

establishing a hermetic seal in each of the spaced apart production wells, the hermetic seal being between the underground coal seam and the surface of the earth,

establishing an oxidizer injection conduit from the surface of the earth through an emplaced whipstock located at the bottom of a first production well,

aligning the oxidizer injection conduit emerging from the whipstock toward a second production well, the emerging oxidizer injection conduit being positioned substantially at the bottom of the underground coal seam, and the emerging oxidizer injection conduit being aligned substantially parallel to the interface between the underground coal and the underburden,

establishing an oxidizer injection conduit from the surface of the earth through an emplaced whipstock located at the bottom of the second production well,

aligning the oxidizer injection conduit emerging from the whipstock in the second wall toward the first production well, the emerging oxidizer injection conduit being positioned substantially at the bottom of the underground coal seam, and the emerging oxidizer injection conduit being aligned substantially parallel to the interface between the underground coal and the underburden,

igniting the coal seam in the first production well,

igniting the coal seam in the second production well,

injecting an oxidizer through the oxidizer injection conduit in the first production well with the resultant burning of a first channel in the path of the oxidizer blast,

injecting an oxidizer through the oxidizer injection conduit in the second production well with the resultant burning of a second channel in the path of the oxidizer blast,

inserting additional length of oxidizer injection conduit into the first production well with the resultant movement of the oxidizer release point moving in consonance with the retreating burning face of the first channel through the underground coal,

inserting additional length of oxidizer injection conduit into the second production well with the resultant movement of the oxidizer release point moving in consonance with the retreating burning face of the second channel through the underground coal,

continuing injection of the oxidizer into the first well and into the second well until the channel in the first well merges with the channel in the second well.

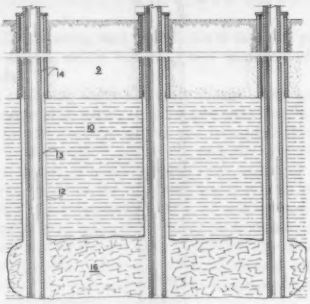
4,185,693

OIL SHALE RETORTING FROM A HIGH POROSITY CAVERN

Robert E. Crumb, S.P.L.A.I., Libya; William L. Martin, Ponca City, Okla., and Gary C. Young, Visalia, Calif., assignors to Conoco, Inc., Ponca City, Okla.

Filed Jun. 7, 1978, Ser. No. 913,406
Int. Cl.[2] E21B *43/24, 43/26*
U.S. Cl. 166—259 **9 Claims**

1. A method of producing hydrocarbonaceous liquids from subterranean kerogen-containing oil shale formations covered by an overburden comprising sequentially (a) penetrating the oil shale deposits with at least two well bores, designating a first well bore and at least one second well bore; (b) fracturing the oil shale deposits so as to provide communication between the first well bore and the second well bores in a lower vertical portion thereof: (c) igniting the hydrocarbonaceous deposit at a point near the first well bore in the presence of a free oxygen-containing gas; (d) introducing through the first well bore a free oxygen-containing gas to the ignited point of the oil shale deposit to effect thermal decomposition of the hydrocarbonaceous material therein and to propagate a combustion zone through the fractured communication area between the first well bore and the second well bore, thereby forming a region of combusted shale between the first well bore and the second well bore; (e) allowing the combustion to continue until a sufficient volume of combusted shale has been formed between the two well bores; (f) then jetting an aqueous liquid into and through the combusted and spent shale zone to remove the mineral residue remaining from the combustion of the kerogen in the oil shale; (g) positioning conventional explosives in the oil shale deposit in the vicinity of the washed out cavity formed in step (g) such that the energy generated upon detona-



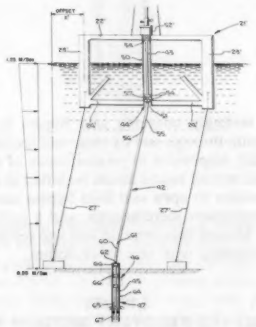
tion of the explosive interacts with and extends into the cavity; (h) detonating the explosives thereby causing the oil shale deposit to be fragmented and to collapse into the cavity creating a rubblized zone of relatively high permeability and porosity; (i) then igniting the oil shale by heating and introducing a free-oxygen-containing gas at the top of the rubblized zone by way of one of the well bores to combust and retort the rubblized carbonaceous deposit.

4,185,694

MARINE RISER SYSTEM

Edward E. Horton, Portuguese Bend, Calif., assignor to Deep Oil Technology, Inc., Irvine, Calif.

Filed Sep. 8, 1977, Ser. No. 831,379
Int. Cl.[2] E21B *7/12*
U.S. Cl. 166—350 **9 Claims**



1. In a marine riser system for conducting fluid between a platform and a well means in a seabed formation and for minimizing stresses in said riser system, the combination of:

a riser pipe having an upper riser portion and a lower riser portion;

a hawse pipe fixed on said platform and extending from a production deck to a submerged platform member and receiving said upper riser portion;

a hawse pipe at said well means extending into said seabed formation for a selected distance and receiving said lower riser portion;

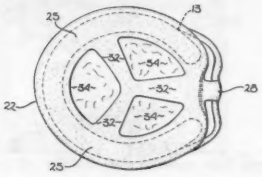
and means non-fixedly connecting said upper and lower riser portions to their respective hawse pipes including fulcrum members on each of said upper and lower riser portions, the fulcrum members on each riser portion being separated a selected distance to permit bending of the pipe portion between said separated fulcrum members and being loosely fitted within said hawse pipes for axial, lateral, and rotational relative movement with respect thereto.

4,185,695

TEMPORARY FOOTWEAR FOR HOOFED ANIMALS

Reginald P. Hancock, 1463 Obispo Ave., Long Beach, Calif. 90804

Filed Nov. 23, 1977, Ser. No. 854,468
Int. Cl.[2] A01L *3/00, 5/00*
U.S. Cl. 168—18 **11 Claims**



1. Temporary protective footwear for a hoofed animal which has been shod comprising:

a lower hoof encircling band for engaging the periphery of a hoof, said lower band including:

(i) an upstanding lip; and

(ii) a generally transverse member coupled to said lip which engages the lower surface of a shoe worn by said animal, said transverse member comprising a generally transverse annular section and at least one first strap disposed across the opening defined by said annular section;

a packing means disposed generally between said transverse member and said hoof, said packing means being a means for providing moisture to said hoof and for partially supporting said hoof;

an upper hoof encircling band for engaging the hoof above said lower band; and

at least one second strap interconnecting said lower and upper hoof encircling bands;

whereby said footwear provides protection from said shoe, improves blood circulation in the hoof and keeps the hoof moist.

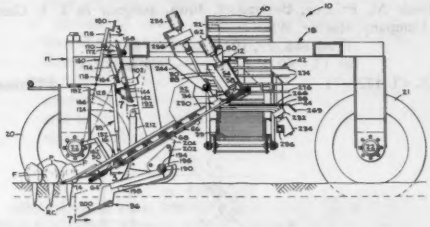
4,185,696

ROW CROP HARVESTER WITH ADJUSTABLE PICKING HEADS

Rodney B. Williams, Paso Robles, and Jerry A. Taylor, Dixon, both of Calif., assignors to Dixon "Y" Machine, Incorporated, Dixon, Calif.

Filed Apr. 25, 1977, Ser. No. 790,355
Int. Cl.[2] A01D *27/04*
U.S. Cl. 171—38 **10 Claims**

1. In a row crop harvester for simultaneously harvesting two rows of plants; the combination of a steerable mobile vehicle having a chassis, a pair of picking heads supported by said chassis, means for independently mounting one end of each picking head on the chassis for pivotal movement about vertical and horizontal axes, means for locking the other end of one of said heads in preselected transverse position relative to the vehicle depending upon the spacing of the rows in the field being harvested for maintaining alignment of said one head with one of said rows by steering the vehicle while allowing said one head to pivot about said horizontal axis during harvesting, and adjustment means connected between the chassis and the other head for selectively laterally shifting the other



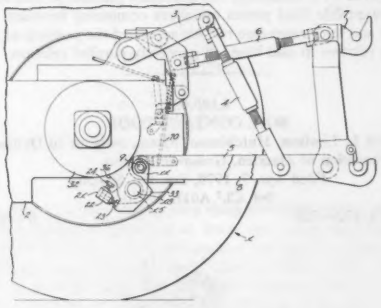
end of the other head transversely along a fixed path relative to said one head and to the chassis during harvesting for maintaining alignment of said other head with the second row when the spacing between the rows varies, said adjustment means being operator controlled during harvesting.

4,185,697

TORSION BAR DRAFT LOAD LIMIT AND PRELOAD ADJUSTER

David A. Berg, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 7, 1977, Ser. No. 840,292
Int. Cl.[2] A01B *63/112*
U.S. Cl. 172—10 **10 Claims**



1. A draft load sensing mechanism for a tractor comprising, a tractor chassis, a torsion bar having one end connected to said tractor chassis, a pair of draft arms, a draft load transmitting means including a torsion tube connected to the other end of said torsion bar and arms extending radially therefrom connected to said draft arms to apply torque to said torsion bar in response to the load on said draft arms, said chassis defining a fixed preload abutment and a fixed maximum load limit stop radially spaced from said torsion bar and angularly spaced a predetermined dimension from each other, a radial arm means connected to said torsion tube forming surfaces defining a lesser angular dimension than the abutment and stop for selectively engaging said abutment and said stop and defining a load range, said radial arm means including a preload adjusting member adjustably engaging said preload abutment for adjustably setting a preload torque on said torsion bar and the minimum signal generating draft load within the load range for said draft load sensing mechanism, said radial arm means including an element adjustably varying the angular dimension between said element and said maximum load limit stop independent of said preload torque adjusting member to infinitely vary the

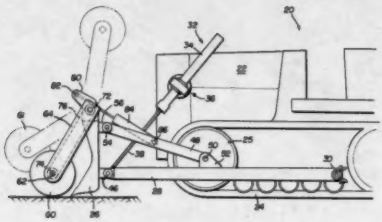
load range of the draft load sensing mechanism and the maximum signal generating draft load within the load range.

4,185,698

ADJUSTABLE AUGER DOZER

Claude M. Frisbee, Bettendorf, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Feb. 27, 1978, Ser. No. 881,294
Int. Cl.[2] E02F 3/06, 3/76; A01B 35/18
U.S. Cl. 172—71 **8 Claims**



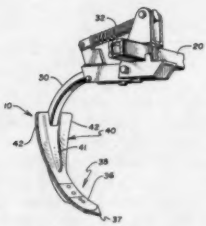
4. An earth working machine, comprising a prime mover, a push-beam pivotally supported on opposed sides of said machine, an earth working blade supported on the ends of said push-beams, generally perpendicular to the longitudinal axis of said prime mover, said blade having a pair of support links pivotally connected to the upper portion of said blade on opposed sides of said blade and said links extending forwardly, a spiral auger journaled between said support links and rotatably driven by a drive means, said opposed support links interconnected by a transverse rod generally parallel to said blade and extensible fluid piston cylinders connected between said frame and said transverse rod for adjusting the position of said auger relative to said blade in generally parallel relation.

4,185,699

SOIL CONTACT TOOL

Howard L. Lewison, Hutchinson, Minn., assignor to Dynamics Corporation of America, Greenwich, Conn.

Filed Apr. 7, 1978, Ser. No. 894,362
Int. Cl.[2] A01B 39/20
U.S. Cl. 172—724 **8 Claims**



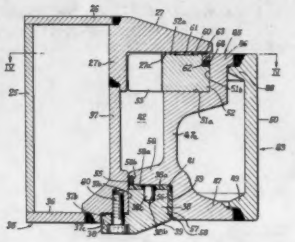
1. A soil contact tool adapted to be mounted on and forwardly of a curved tool mounting shank comprising, a composite tool formed of a narrow ground engaging section having a forwardly facing working surface of narrow uniform width and further having a pointed tip and a moldboard section shaped triangularly when considered in a plane extending generally along its length and extending above and outwardly from the ground engaging section, said triangular moldboard section having a smaller centrally located triangular portion defined by a pair of forwardly facing working surfaces individually convex in shape and meeting at a center line of said moldboard section and having outwardly disposed concavely shaped side portions forming a V-shape with said centrally located triangular portion, and means in one of said sections for mounting the tool on the end of the curved tool shank, said tool being curved along its extent to be positioned forward of the shank with the ground engaging section extending below and forward of the end of the shank.

4,185,700

CIRCLE MOUNTING AND CIRCLE ASSEMBLY FOR A MOTOR GRADER

Robert A. Atherton, Blue Grass, Iowa; Donald R. Berchtold, and Gene B. Easterling, both of Decatur, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 696,162, Jun. 14, 1976, abandoned. This application Mar. 1, 1978, Ser. No. 882,541
Int. Cl.[2] E02F 3/76
U.S. Cl. 172—796 **6 Claims**



1. A motor grader circle mounting and circle assembly comprising, in combination:

a circle mounting comprising an annular, upright wall member, said wall member having a lower, continuous, circumferential, upright, outwardly facing, finished surface of predetermined height,

an outwardly extending top flange which is integral with said wall member and has a bottom bearing surface,

a bottom flange member which has a continuous circumferential, upright inwardly facing, finished surface, the height of which is a major portion of said predetermined height, and which bears against the lower part of said outwardly facing surface, a planar top surface, and a circumferential, upright outer face,

and means detachably securing said bottom flange member to said upright wall member;

removable segmental planar, lower bearing plate means seated on said planar top surface;

removable segmental arcuate bearing plate means encircling said outer face;

a circle structure which has an inwardly extending, annular bottom lip with a shallow inner margin of a height which is a minor portion of said predetermined height and which is slightly spaced from the outwardly facing finished surface of the circle mounting wall member, said bottom lip having finished lower bearing surfaces abutting said planar bearing plate means and said arcuate bearing means, an upright web surrounding said upright wall member, a top web facing the top flange bearing surface, said circle mounting and said circle structure defining an annular lubricant chamber, and an internal gear mounted on said top web in said lubricant chamber;

a lower oil seal ring mounted on said shallow inner margin and sealing said space between said inner margin of said bottom lip and said upright, outwardly facing, finished surface;

segmental upper seal means surmounting said circle structure and bearing on the top flange bearing surface;

and segmental planar top bearing means surmounting the circle structure radially inwardly of said upper seal means and bearing on said top flange bearing surface,

said bottom flange being removable to replace said segmen-

tal planar lower bearing plate means and said segmental arcuate bearing plate means without disturbing said lower oil seal ring.

4,185,701

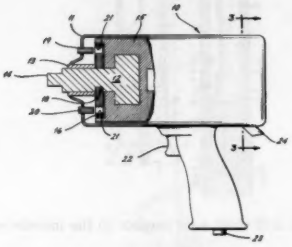
TIGHTENING APPARATUS

John T. Boys, Birkenhead, New Zealand, assignor to SPS Technologies, Inc., Jenkintown, Pa. and SPS Technologies, Inc., Jenkintown, Pa.

Continuation of Ser. No. 579,110, May 19, 1975, abandoned. This application Jul. 25, 1977, Ser. No. 818,511

Int. Cl.[2] B23Q *5/06*

U.S. Cl. 173—12 **88 Claims**



1. Apparatus for tightening a fastener, said apparatus comprising:

wrench means having a pulsed output for periodically applying a tightening moment to a fastener in a joint assembly whereby a peak moment is applied during each period;

first means for measuring the moment applied to the fastener during each period and for developing a signal representative of the peak moment applied during each period;

control means responsive to said peak moment signals for determining when an instantaneous peak moment signal has not increased by more than a positive finite predetermined amount of an order sufficient to indicate that there has been no significant increase in peak moment, said control means also developing a control signal;

and shut-off means responsive to said control signal for discontinuing the output of said wrench means.

4,185,702

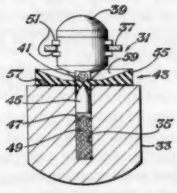
METHOD AND APPARATUS FOR BOREHOLE PERFORATING

Gerald D. Bullard, c/o Goodwell Inc., P. O. Box 195, Upton, Wyo. 82730

Filed Apr. 13, 1978, Ser. No. 896,197

Int. Cl.[2] E21B *7/00*

U.S. Cl. 175—4.54 **3 Claims**



1. A perforator gun comprising:

a. a gun body having a bullet receiving bore;

b. shaped charge carrier means mounted on said gun body;

c. a perforator unit including:

i. a shaped charge disposed on said carrier means so as to face outwardly in co-axial alignment with and adjacent the outer end of said bore;

ii. a bullet disposed in said bore with a powder load behind the bullet;

iii. seal means effective to prevent entry of fluid into said bore prior to the firing of said unit;

iv. detonating cord disposed in firing relation to said shaped charge and being the sole means to initiate the firing of said unit;

said perforator unit being thus adapted to fire said shaped charge responsive to detonation of said detonating cord and to fire said bullet responsive to the firing of said shaped charge.

4,185,703

APPARATUS FOR PRODUCING DEEP BOREHOLES

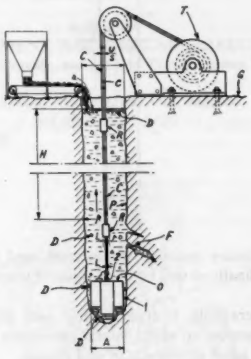
Paul L. Guerber, Drancy, France, assignor to Coyne & Bellier, Bureau d' ingenieurs Conseils, Paris, France

Division of Ser. No. 749,833, Dec. 10, 1976, Pat. No. 4,116,285. This application May 24, 1978, Ser. No. 908,969

Claims priority, application France, Jun. 18, 1976, 76 18585

Int. Cl.[2] C09K *7/00;* **E21C** *7/06*

U.S. Cl. 175—17 **9 Claims**



1. Apparatus for drilling very deep boreholes in the ground without tubing, comprising at least one rotary drilling tool with a built-in motor, said drilling tool having a cross-sectional area A substantially equal to the cross-section S of the hole to be drilled, means for moving said tool downwards in the borehole, said means comprising a line of supporting elements of great length having a lower end fixed to said tool said line of supporting elements having a cross-sectional area which increases from a lower end value L much smaller than A and S to an upper end value U larger than L but much smaller than A and S, electrical resistances fixed at predetermined points on said line of supporting elements, said electrical resistances also having a cross-sectional area r much smaller than A and S, at least one electrical cable for supplying electrical power to said resistances from the ground surface, means for supplying said motor from the ground surface, and means for filling the borehole with at least one melting substance.

4,185,704

DIRECTIONAL DRILLING APPARATUS

Jeddy D. Nixon, Jr., Houston, Tex., assignor to Maurer Engineering Inc., Houston, Tex.

Filed May 3, 1978, Ser. No. 902,377

Int. Cl.[2] E21B *7/06*

U.S. Cl. 175—76 **10 Claims**

1. Apparatus for directional drilling in the earth comprising, a stator housing adapted to be connected at one end to a string of drill pipe,

a rotor shaft supported for rotation in said stator housing and having one end extending from the other end of said stator housing and adapted to support a drill bit thereon,

means supported on said stator housing adjacent one end thereof engagable with one side of the hole being drilled to provide a fulcrum for changing the direction of said hole,

a thrust member supported on said stator housing adjacent the other end thereof and operable to be moved laterally therefrom to engage the side of said hole opposite said one side to move said stator housing laterally in the opposite direction to pivot about said fulcrum and change the axis of rotation of said rotor shaft and thereby change the direction of drilling said hole,

a fluid pressure operated piston positioned for movement longitudinally of said housing adjacent to said thrust member,

means operatively interconnecting said piston and said thrust member to effect lateral movement of said thrust member upon movement of said piston,

said means supported on said stator housing comprising a barrel member secured thereon and having an external surface that is arcuate in longitudinal cross section and having spiral grooves therein, and

said barrel member being positioned relative to said movable means in the relation of a lever of the first order.

4,185,705

WELL PERFORATING TOOL

Gerald Bullard, P.O. Box 195, Upton, Wyo. 82730

Filed Jun. 20, 1978, Ser. No. 917,269

Int. Cl.[2] E21B *1/06*

U.S. Cl. 175—78 **10 Claims**

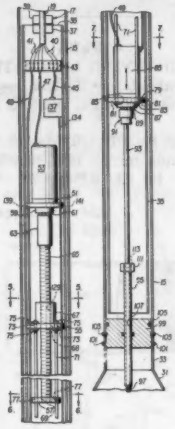
1. A well perforating tool comprising:

(a) an elongate housing for insertion into the well,

(b) at least one flexible drill shaft having a free end for connection to a drill bit,

(c) a first motor disposed within and movable relative to the housing for rotating the flexible drill shaft, and

(d) a second motor carried by the housing and operatively connected to the first motor for moving the latter along the longitudinal axis of the housing to advance and retract



the flexible drill shaft with respect to the interior wall of the well.

4,185,706

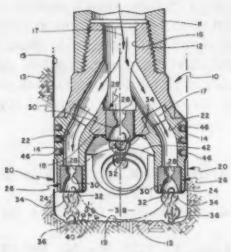
ROCK BIT WITH CAVITATING JET NOZZLES

William Baker, III, Costa Mesa, and Joe W. Vincent, Balboa Island, both of Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Nov. 17, 1978, Ser. No. 961,579

Int. Cl.[2] E21B *9/08*

U.S. Cl. 175—340 **7 Claims**



1. In at least a two cone rock bit which utilizes the hydraulic action of circulating drilling mud by directing the mud through one or more nozzles directed toward the bottom of a hole to aid the process of advancing the bit in said hole, the improvement which comprises:

at least one cavitating jet nozzle body in said rock bit, said body having a first upstream opening formed by said body smaller than a second downstream exit opening, the axis of said nozzle being substantially aligned with the axis of said bit, said body further defining a throat section positioned between said first and second opening, said throat having an opening smaller than said first upstream opening, said throat section is closer to said upstream opening than said downstream exit opening, the diverging walls formed by said cavitating nozzle downstream of said throat forming an interior chamber thereby, said at least one nozzle body when subjected to said circulating drilling mud induces cavitation of the mud as it exits past said throat of said

nozzle where said drilling mud flows through said nozzle body at a rate of about 500 feet per second.

4,185,707

AUGER CONSTRUCTION

Alvin K. Wilson, 89900 Demming Rd., Elmira, Oreg. 97437

Continuation of Ser. No. 712,841, Aug. 9, 1976, abandoned. This application Apr. 10, 1978, Ser. No. 894,683

Int. Cl.[2] E02D *17/14;* **E21B** *9/04;* **E21C** *1/14*

U.S. Cl. 175—394 **1 Claim**

1. In an auger for the forming of small diameter ground holes in rocky ground for the planting of tree seedlings, said auger having a central shaft and helical flighting, the improvement comprising,

a semicurcular control plate on said shaft disposed normally to the shaft axis adjacent the shaft lower end to inhibit auger penetration and having an outer edge, carbide bits contiguously secured to said outer edge,

said helical flighting terminating in a leading edge,

said semicurcular control plate intersecting the flighting,

upper and lower superposed rows of carbide bits secured to said flighting leading edge, the last mentioned carbide bits being of trapezoidal shape and each having a rearwardly inclined frontal surface which jointly conprise an elongate substantially planar rearwardly inclined cutting surface to provide a long wearing protective leading surface for the auger flighting, and

said helical flighting having carbide bits secured to the flighting peripheral wall in a contiguous manner to protect said wall from abrasion.

4,185,708

BIT FOR DRILLING HOLES IN ROCKS

Kazimierz Pawlik; Jadwiga Janikowska-Pawlik, and Adam Siedlar, all of Cracow, Poland, assignors to Akademia Gorniczo-Hunicza im, Stanislawa Staszica, Cracow, Poland

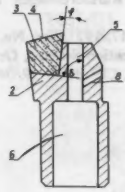
Filed Jul. 3, 1977, Ser. No. 814,117

Claims priority, application Poland, Aug. 31, 1976, 192149

Int. Cl.[2] E21C *13/00*

U.S. Cl. 175—410 **3 Claims**

1. A bit for drilling holes in rocks comprising a cylindrical shank with an integral extension constituting a bit head, and a plurality of inserts of sintered carbide secured in said extension and distributed symmetrically around the axis of said cylindrical shank, said inserts projecting axially beyond said bit head to constitute drill points situated symmetrically with respect to said axis of the cylindrical shank, said inserts each having the shape of an irregular quadrangle in a longitudinal plane passing through said insert, said inserts each having a profiled shape with a convex bottom portion in a transverse plane perpendicular to said longitudinal plane, the profiled shape of each insert in said transverse plane including upper inclined faces intersecting along an edge forming the drill point one of which faces constitutes a face plane inclined at an angle of incidence γ with respect to a plane extending perpendicular to the axis of the shank, said quandrangle having an inner side closest to said axis of the shank which is inclined thereto at an acute angle ϕ,



and a lower base inclined with respect to said axis of the shank at an angle ϵ satisfying the relation $90° > \epsilon > 90° - \phi$, said profile shape of the bit having an axis of symmetry angularly offset with respect to a plane perpendicular to said axis of said cylindrical shank at an angle τ satisfying the relation $90° \geqq \tau \leqq 90° + \gamma$.

4,185,709

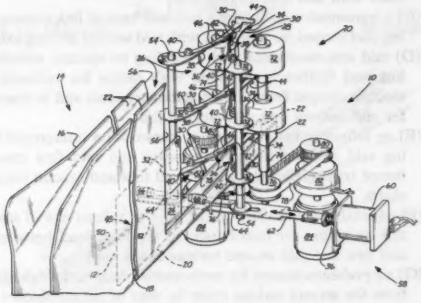
DOCUMENT WEIGHING APPARATUS

Robert Irvine, Riverside, assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Nov. 30, 1978, Ser. No. 965,108

Int. Cl.[2] B07C *5/20*

U.S. Cl. 177—145 **9 Claims**



1. Apparatus for weighing documents of different thickness serially fed thereto, said apparatus comprising:

a. a scale including a channel-shaped document weighing platform for receiving vertically oriented documents serially fed thereto, said platform including a bottom wall for guiding respective lower edges of documents fed to said platform, said platform including opposed side walls for guiding opposed major surfaces of respective documents fed to said platform, whereby said walls cooperatively define a passageway for documents fed to said platform;

b. means for decelerating movement of respective documents in said passageway, said decelerating means including a pair of flexure springs mounted for movement between a passageway restricting position and a non-passageway restricting position, said flexure springs oriented with respect to each other when disposed in said passageway restricting position for cooperatively progressively restricting said passageway in the direction of downstream movement of respective documents in said passageway such that said flexure springs exert decelerating forces on opposed major surfaces of respective documents in said passageway; and

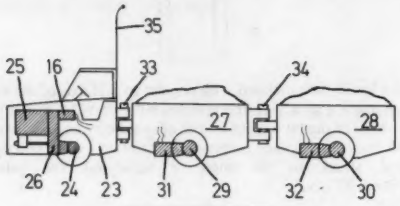
c. means for moving said flexure springs.

4,185,710

VEHICLE HAVING AT LEAST TWO DRIVEN AXLES

Sven-Olof Kronogard, Karstorpsvägen 31, Lomma, Sweden (23400)

Filed Oct. 17, 1977, Ser. No. 842,900
Claims priority, application Sweden, Oct. 21, 1976, 7611668
Int. Cl.² B62D *59/04*
U.S. Cl. 180—14 A **1 Claim**



1. A vehicle having at least first and second driving axles supported by ground engaging members and comprising:

(A) a prime mover including a gas turbine having at least two turbine rotors mounted upon separate first and second shafts and supplied with motive gas from a common gas generating portion including at least one combustor,

(B) a mechanical gearing means connecting said first turbine shaft with said first driving axle,

(C) a transmission including a non-mechanical link connecting said second turbine shaft with said second driving axle,

(D) said non-mechanical link including an electric transfer link and further is provided with means for collecting electric current from a fixed stationary main and to transfer said current into said electric link,

(E) an infinitely variable further transmission interconnecting said mechanical gearing means and said first mentioned transmission by way of said first and second rotor shafts,

(F) adjustable guide vanes at the inlet of at least one of said turbine rotors for distribution of the total load between said first and said second turbine shafts, and

(G) air preheater means for recirculating heat in the exhaust from the second turbine rotor by way of the combustor.

4,185,711

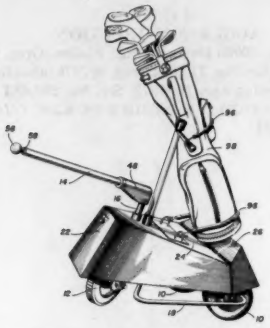
MOTORIZED CART

Richard Lawrence, 39 Manchonis Rd., and Walter Lovell, 348 Mountain Rd., both of Wilbraham, Mass. 01095

Division of Ser. No. 665,233, Mar. 9, 1976, Pat. No. 4,081,047. This application Dec. 22, 1977, Ser. No. 863,304
Int. Cl.² B62D *51/04*
U.S. Cl. 180—214 **1 Claim**

1. A power operated cart comprising a frame, a dirigible wheel on the frame, a shaft on the frame spaced from the dirigible wheel, and wheels on the shaft, a battery and motor on the frame, said motor including a drive shaft having a driving connection with said dirigible wheel,

an automatic variable tension brake comprising a part of the driving connection, said brake comprising a braking element driven by said dirigible wheel, a braking element driven by the motor, and a cam operated interconnection between said two elements, said cam comprising a cylinder connected to the motor and having an angle slot therein and a radial pin extending through said slot from said drive shaft, the cam urging the elements together and comprising means to apply the brake when the wheel



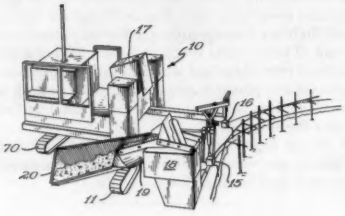
overrides the motor, said cam urging the elements apart to release the brake when the motor overrides the wheel.

4,185,712

MASTER SLAVE STEERING CONTROL

Frederick J. Bulger, West Dundee, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 16, 1978, Ser. No. 934,106
Int. Cl.² B62D *1/26, 11/20*
U.S. Cl. 180—131 **26 Claims**



14. A steering control system for an earth construction machine having front and rear steerable propelling means capable of being controlled in either of two modes, each rotated independently or both rotated in opposite rotational directions, said system comprising:

front and rear steering sensor means both responsive to a steering reference;

first means responsive to said front steering sensor means and adapted to control the steering of said front steerable propelling means;

slave means adapted to be responsive to the steering of said front steerable propelling means;

second means selectively responsive to said rear sensor means and to said slave means and adapted to operate said front and rear steerable propelling means in one of said modes when responsive to said rear steering sensor means and in the other of said modes when responsive to said slave means.

4,185,713

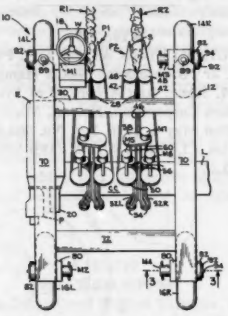
HYDROSTATIC DRIVE SYSTEM

Rodney B. Williams, Higley, Ariz., and Jerry A. Taylor, Dixon, Calif., assignors to Dixon "Y" Machine, Incorporated, Dixon, Calif.

Continuation of Ser. No. 693,461, Jun. 7, 1976, abandoned. This application Feb. 13, 1978, Ser. No. 877,441

Int. Cl.[2] B60K *17/34*

U.S. Cl. 180—242 **1 Claim**



1. In a self-propelled agricultural machine such as a harvesting machine or the like having four wheels, a hydraulic motor for driving each wheel, a drive system for the wheel motors comprising a power source, and hydraulic pump means driven by said source for driving said hydraulic wheel motors, hydraulic line means including delivery and return lines for connecting the two wheel motors on one side of the machine in series with said pump means, and hydraulic line means including delivery and return lines for connecting the two wheel motors on the other side of the machine in series with said pump means; the improvement for use of the machine on a roadway, wherein said hydraulic pump means comprises a single pump driven by said power source, the hydraulic line means for the series connected wheel motors for each side of the machine being respectively connected in parallel to said pump, a shut off valve in the delivery and return lines for the wheel motors on one side of the machine for causing all of the fluid delivered by said pump to flow in series through the wheel motors on the other side of the machine, and means for mechanically declutching the wheels from their motors on the valved side of the machine when said valves are shut off for preventing liquid circulation through the motors on said one side of the machine, thereby causing all liquid circulated by said single pump to flow through the series connected motors on the other side of the machine for substantially doubling the speed of the machine along the roadway with a given pump output.

4,185,714

IMPLOSIVE ACOUSTIC GENERATOR

Adrien P. Pascouet, 224 Avenue Republique, Toulon, France (83100), and Chadwick O. Davies, 32 rue Saint Fargeau, Paris, France (75020)

Continuation-in-part of Ser. No. 677,583, Apr. 16, 1976, abandoned. This application Dec. 5, 1977, Ser. No. 857,146

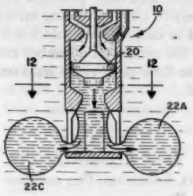
Claims priority, application France, Apr. 18, 1975, 75 12221; Apr. 18, 1975, 75 12222

Int. Cl.[2] G01V *1/14*

U.S. Cl. 181—120 **10 Claims**

1. In an implosive generator adapted to become at least partly submerged in a body of liquid, said generator having a slug chamber provided with an outlet bore freely communicating with said liquid for abruptly expelling therethrough a liquid slug from said slug chamber into said liquid body, the improvement comprising:

a housing defining a suction chamber freely communicating with said bore, said suction chamber having at least one port, whereby, in use, the liquid slug is expelled from said bore into said suction chamber and exits through said port as a liquid jet, and said jet upon becoming expelled from said suction chamber forming a vacuum cavity in said suction chamber and a primary cavity in the liquid body



surrounding the suction chamber, the liquid body rushing into the primary cavity whereby the liquid body becomes compressed and emits a desired primary acoustic signal; said compressed liquid expanding inside the vacuum cavity in said suction chamber which has a volume such that the expansion of the compressed liquid is not accompanied by a significant secondary acoustic signal.

4,185,715

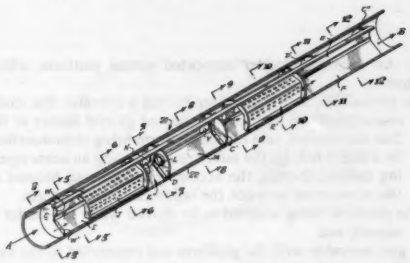
SOUND-ATTENUATING MUFFLER FOR EXHAUST GASES

Rudolph Reu Boiu, 200 N. Minnesota, #23, Glendora, Calif. 91740

Filed May 30, 1978, Ser. No. 910,219

Int. Cl.[2] F01N *1/08*

U.S. Cl. 181—266 **10 Claims**



1. A sound-attenuating muffler for reducing the acoustic energy in an exhaust gas stream, comprising:

an elongated muffler housing having a tubular outer wall and an axis,

at least three vanes axially extending between a first position adjacent to one end of the housing and a second position adjacent to the other end of the housing,

said vanes extending radially between the axis and said wall to define an odd number of axially extending flow passages,

at least one axially extending sound-attenuating section defined by three partition plates axially spaced in the downstream direction,

said partition plates including an entry partition blocking all said passages but one entry flow passage, a reverse flow partition blocking all said passages but an exit flow channel, and an exit partition blocking all said passages but said exit flow channel, said vanes defining transfer port means including one flow port in at least two of the vanes, the respective positions of the flow ports in the respective vanes alternating from a position adjacent to the flow-rev-

ersing partition to a position adjacent to the entry partition to provide a serpentine exhaust gas flow path traversing the sound-attenuating section in alternating directions along each flow passage in sequence from the entry flow channel to the exit flow passage, and

a resonator chamber in each said section, positioned between the flow-reversing partition and the exit partition and extending across said flow passages except the exit channel, said resonator chamber being interconnected by open ports defined in each of said vanes not bounding the exit channel, and the resonator chamber communicating with said serpentine flow path via at least one opening into the entry channel.

4,185,716

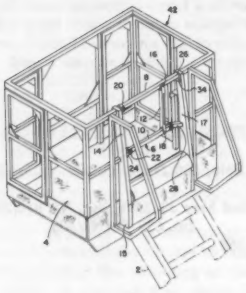
SELF CLOSING GATE

Ronald A. Rinehart, Lancaster, Pa., assignor to Ladder Towers, Inc., Lancaster, Pa.

Filed May 12, 1977, Ser. No. 796,301

Int. Cl.[2] E06C *7/16;* **E04G** *1/26;* **B66B** *13/00*

U.S. Cl. 182—2 **5 Claims**



1. An improved ladder supported rescue platform which comprises

an extendable, movable ladder having a movable free end;

a rescue platform operably connected to said ladder at the free end thereof, said rescue platform being circumscribed by a safety railing, the safety railing having an acess opening defined therein, the access opening being located at the connection between the ladder and the platform,

the platform being adapted to be moved when the ladder is moved; and

a gate movable with the platform and connected to the said railing, said gate being adapted to close the access opening, said gate being adapted to move in a vertical plane between open and closed positions and to be self closing whereby the access opening defined in the safety railing when the gate is open facilitates movement between the platform and the ladder,

the gate comprising a first vertical member, a movable vertical member, an upper rail having first pivotal connection at the first vertical member and a second pivotal connection to the movable vertical member,

the upper rail terminating outwardly from the second pivotal connection in an elongated movable end, a lower rail having a first pivotal connection at the first vertical member and a second pivotal connection to the movable vertical member, the lower rail terminating outwardly from the second pivotal connection in a short movable end, vertical offset means to prevent contact between the upper and lower rails when the gate is moved between the said open and closed positions, and wherein a locking mechanism is affixed to the safety railing and projects into the access opening in a position to receive and to releasably lock the movable end of the upper rail and wherein a stationary member is affixed to the safety railing and projects into the access opening below the locking mechanism in a location to receive the short movable end of the lower rail, the locking mechanism being shorter in length than the stationary member and the locking mechanism projecting into the access opening a lesser distance than the stationary member,

whereby a workman can safely enter the platform from the ladder by raising the gate and whereby the gate will automatically close to maintain the integrity of the safety railing.

4,185,717

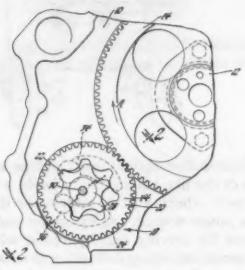
ENGINE LUBRICATING OIL PUMP

Harry S. Ford, Jr., Birmingham; Nshan Hamparian, Brighton, and Tanas M. Sihon, Ann Arbor, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 8, 1978, Ser. No. 903,926

Int. Cl.[2] F16H *41/00;* **F15B** *9/02*

U.S. Cl. 184—6.28 **1 Claim**



1. An oil pump and drive for use in an internal combustion engine having a cylinder block and a rotatable shaft, said oil pump and drive comprising; a cavity in said cylinder block having an end wall; a bushing secured in said cavity; an internally and externally toothed external gear rotatably supported in said bushing; a drive gear driven by said rotatable shaft and meshing with the external teeth on said external gear, whereby the external gear is rotated; a bearing support secured to said cylinder block within said cavity; a bearing mounted on said bearing support; an externally toothed internal gear meshing with the internal teeth of said external gear and cooperating therewith to pump oil when said external gear is rotated, said internal gear being rotatably supported on said bearing; a cover plate and seal member secured on said cylinder block only by said bearing support and maintained only by said bearing support in sealing engagement with the side of the external gear facing outwardly from said cavity for enclosing one side of said internal and external gears to prevent oil leakage from between said internal and external gears, said end wall sealing the other side of said internal and external gears; and oil passages formed in said cylinder block and intersecting said end wall of said cavity for communicating oil to and from said pump.

4,185,718

METHOD OF JOINTING TEXTILE BELTING OR WEBBING

Christopher Cawthra, Bradford, and Richard K. Brooke, Cleckheaton, both of England, assignors to BBA Group Limited, Cleckheaton, England

Continuation-in-part of Ser. No. 773,204, Mar. 1, 1977, abandoned. This application Aug. 21, 1978, Ser. No. 934,713

Claims priority, application United Kingdom, Mar. 4, 1976, 8690/76

Int. Cl.[2] C09J *5/00*

U.S. Cl. 156—258 **6 Claims**

1. A method of jointing textile belting or webbing having a

moisture content of at least 5% by weight with a polyurethane compound, which method comprises:

forming in the two ends of the belting or webbing to be joined a complementary array of V-shaped notches that extends across the full width of said ends;

fitting the complementary notched ends together so as to leave a small gap between the ends of the belt;

before or after said fitting together procedure, applying a sufficient amount of a liquid castable mixture at substantially ambient temperature to fill said gap when the ends are fitted together, the liquid castable mixture being heat curable to provide the polyurethane compound and comprising a polyisocyanate or a polyurethane prepolymer comprising a reaction product of a polyisocyanate, and a polyactive hydrogen containing compound in which active hydrogen groups are chemically blocked at ambient temperature;

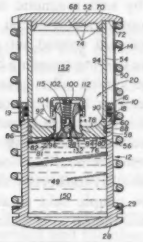
and heat curing the mixture in the gap at a comparatively high temperature above ambient that is at or above a temperature at which said polyactive hydrogen containing compound becomes unblocked, to join the notched ends.

4,185,719

TRUCK DAMPING

Richard C. Farris, Jeshua, and William S. Butler, Burleson, both of Tex., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 679,620, Apr. 23, 1976, Pat. No. 4,106,412.
This application Jun. 2, 1978, Ser. No. 912,120
Int. Cl.[2] B61F *5/06, 5/12, 5/14;* B61H *11/00*
U.S. Cl. 188—33 **4 Claims**



1. A method of uni-directionally dampening the motion of two spaced objects relative to one another, which comprises the steps of:

(a) providing a motion dampening apparatus containing liquid therein between the two objects, the motion dampening apparatus comprising:

a movable piston;

cylinder means, for sealingly surrounding at least a portion of said piston, said cylinder means including end cap means for closing a first end, a second open end axially opposite to the first end, and an internal surface therebetween;

a high pressure chamber initially containing said liquid therein between the closed end of said cylinder means and said piston;

a reservoir on an opposite side of said piston from said high pressure chamber;

two-way valve means, in said piston;

spiral groove means disposed between said piston and said cylinder means; and

fixed diameter orifice means between said high pressure chamber and said reservoir;

(b) contracting and expanding said motion dampening apparatus responsive to movement of the two objects toward and away from one another respectively thereby forcing said liquid out of and into said high pressure chamber respectively;

(c) directing a first portion of said liquid flowing out said high pressure chamber at a first pressure level, during movement of said objects toward each other, through said spiral groove means into said reservoir;

(d) directing a second portion of said liquid flowing out said high pressure chamber at a second pressure level equal to the first pressure level and increasing therefrom through said fixed diameter orifice means into said reservoir; and

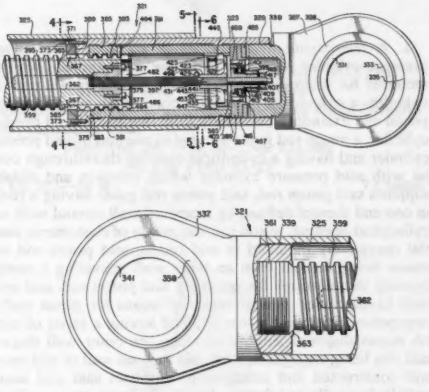
(e) directing a third portion of said liquid flowing out said high pressure chamber through said two-way valve means into said reservoir, said two-way valve means having substantially greater cross-sectional area than the cross-sectional area of said first fixed orifice and allowing said liquid to flow from said high pressure chamber into said reservoir at a third predetermined pressure level greater than either the first and second predetermined pressure level.

4,185,720

ADJUSTABLE LOCKING STRUT

William S. Wright, Jr., Corona Del Mar, and Elmer C. Yang, Orange, both of Calif., assignors to Pacific Scientific Company, City of Commerce, Calif.

Continuation of Ser. No. 695,223, Jun. 11, 1976, abandoned.
This application Sep. 1, 1977, Ser. No. 829,834
Int. Cl.[2] F16F *7/04*
U.S. Cl. 188—134 **24 Claims**



1. A mechanism for arresting motion between first and second relatively movable objects, comprising:

a first member axially and rotationally fixed on said first object;

a second member axially and rotationally fixed on said second object;

a rotating member directly interposed between said first and second members, said rotating member having surfaces for engaging said first and second members when motion between said first and second members is to be arrested but said surfaces normally having sufficient clearance from each of said first and second members to allow rotation thereof without interposed bearings; and

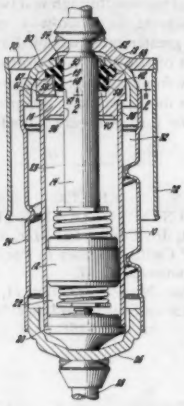
means for rotating said rotating member in response to relative movement between said first object and first member and said second object and second member, said means transmitting only rotational forces to said rotating member and maintaining said clearance when said relative movement is below a predetermined motion threshold and being incapable of maintaining said clearance when said motion threshold is above said predetermined motion threshold.

4,185,721

SPRINGLESS SEAL FOR SHOCK ABSORBER

Elgin J. Karklins, Kettering, and Michael L. Oliver, Xenia, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 3, 1978, Ser. No. 893,045
Int. Cl.[2] F16F 9/36
U.S. Cl. 188—322 4 Claims



1. A telescoping hydraulic shock absorber comprising a pressure cylinder having a hydraulic fluid therein, a piston mounted for reciprocating sliding movement in said pressure cylinder, a cylindrical piston rod operatively secured to said piston and extending outwardly from one end of said pressure cylinder, a piston rod guide secured in one end of said pressure cylinder and having a cylindrical opening therethrough coaxial with said pressure cylinder which receives and slidably supports said piston rod, said piston rod guide having a recess in one end thereof defined by a tapered wall coaxial with said cylindrical opening, piston rod seal means of elastomeric material operatively mounted in said recess, said piston rod seal means being conical with an inner wall providing a central opening therethrough for receiving said piston rod, said inner wall having inner annular inner lip means for direct sealing engagement with said piston rod and having a series of outer rib means disposed lengthwise along the outer wall thereof, said ribs being engageable with said tapered wall of said recess and constructed and arranged to constrict said seal means radially inwardly and thereby forces said lip means to sealingly engage the periphery of said piston rod to prevent the passage of fluid from said pressure cylinder to the exterior of said shock absorber through said recess.

4,185,722

MAGNETIC CLUTCH AND BRAKE ASSEMBLY

Ansell W. Palmer, Hampton, N.H., and Francis J. Stevens, North Berwick, Me., assignors to General Electric Company, Somersworth, N.H.

Filed Oct. 25, 1977, Ser. No. 845,201
Int. Cl.[2] F16D 67/06
U.S. Cl. 192—18 B 10 Claims

1. A magnetic clutch and brake assembly for positively braking and driving a rotatable gear comprising:

(a) a solenoid coil mounted in spaced relationship to said rotatable gear;

(b) a shaft positioned within said solenoid coil;

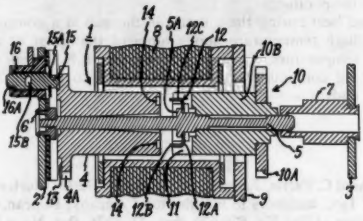
(c) a magnetic member reciprocally and rotatably mounted on said shaft in continuous meshing engagement with said rotatable gear;

(d) first and second sets of detents positioned, respectively, on opposite ends of said magnetic member;

(e) a brake post mounted in cooperating relationship with said first set of detents, whereby a portion of said brake post, with reciprocal and rotatable movement of said magnetic member, may be positioned within an aligned detent of said first set to provide positive braking of said magnetic member when said magnetic member is moved into contact with said brake post;

(f) a clutch idler gear assembly mounted on said shaft with one end thereof positioned to come into frictional contact with the end of said magnetic member having said second set of detents positioned thereon, to thereby rotate said magnetic member;

(g) a dog of magnetizable material mounted for limited axial movement on said shaft between said magnetic member and said clutch idler assembly, said dog being in continuous sliding engagement with said clutch idler gear assembly and said dog further being continuously biased toward said magnetic member under the influence of the magnetic field produced by said magnetic member, wherein said dog includes a tooth portion which may enter at least one aligned detent of said second set of detents to thereby provide a positive driving coupling between said magnetic member and said clutch idler gear assembly while said magnetic member is in frictional contact with said clutch idler gear assembly and being rotated thereby;



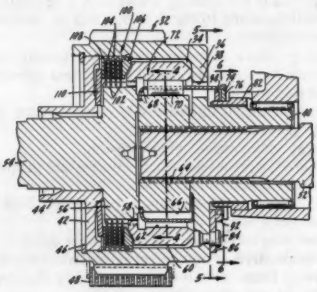
(h) means for selectively energizing said solenoid coil to move said magnetic member between said brake post and said idler gear assembly to thereby alternatively brake said rotatable gear or couple said rotatable gear in driving relationship to said clutch idler gear.

4,185,723

AUTOMATIC FOUR-WHEEL DRIVE TRANSFER CASE

Donald W. Kelbel, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 750,048, Dec. 13, 1976, abandoned.
This application May 8, 1978, Ser. No. 903,429
Int. Cl.[2] F16D 41/10, 47/04
U.S. Cl. 192—36 9 Claims



1. A torque transfer assembly comprising an input shaft, first

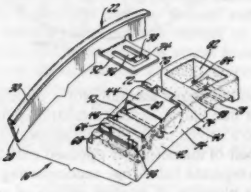
and second output shafts, means coupling said input shaft with said output shafts for transfer of torque thereto, said coupling means including an overrunning clutch having wedging means movable between two positions wherein torque is transferred to said second output shaft and an intermediate position wherein torque is not transferred to said second output shaft, means for biasing said wedging means toward one of said transferring positions, means operable upon rotation of one of said shafts for blocking said movement of said wedging means to the other of said transferring positions, and drive means coupling said output shafts for transfer of torque therebetween at a constant rate independently of said overrunning clutch.

4,185,724

PREASSEMBLED UNIT AND ROLLER CLUTCH SUBASSEMBLY HAVING SAME

Oscar G. Kitchin, Port Clinton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 31, 1978, Ser. No. 929,309
Int. Cl.[2] F16D *3/34, 63/00, 41/06*
U.S. Cl. 192—45 **4 Claims**



1. In a unit handled roller clutch subassembly having a sheet metal cage with a single end ring portion and a plurality of circumferentially spaced, integral tab portions extending in cantilevered fashion therefrom in an axial direction, a plurality of bearing blocks of low friction material having inner and outer bearing surfaces mounted on respective tab portions for centering inner and outer clutch races with respect to each other, a slot in each bearing block receiving an associated tab portion for securing the bearing block to the cage, the improvement comprising:

each of said bearing blocks having a rectangular pocket and forming a preassembled unit together with a roller translatable in a circumferential direction in the rectangular pocket and a spring mounted at one end of the rectangular pocket engaging the roller and biasing it in a retained position in the rectangular pocket.

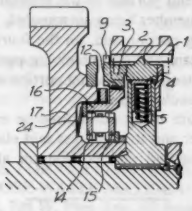
4,185,725

SYNCHRONIZER ARRANGEMENTS FOR STEPPED-RATIO TRANSMISSIONS

Mario J. Maina, Luton, England, assignor to General Motors Corporation, Detroit, Mich.

Filed May 15, 1978, Ser. No. 905,744
Claims priority, application United Kingdom, May 17, 1977, 20670/77
Int. Cl.[2] F16D *23/06*
U.S. Cl. 192—53 F **8 Claims**

1. A synchronizer arrangement for bringing first and second rotary members of a stepped-ratio transmission into rotary synchronism, comprising a primary synchronizer element drivable by the first rotary member and provided with a friction surface, an intermediate element provided with a friction surface, means for effecting axial movement of the primary synchronizer element into frictional engagement with the intermediate element and thereby produce a synchronizing drag torque component at the intermediate element by co-operation of the said friction surfaces, a pair of co-operating ramp surfaces arranged to rotate with the intermediate element and the second rotary member respectively, means providing axial reaction for the ramp surface which rotates with the second rotary member, and a secondary synchronizer element that is connected to rotate with the second rotary member and is of higher torque-inducing capacity than the primary element, the secondary synchronizer element having a pair of opposed radially extending annular friction-clutch surfaces, and the synchronizing drag torque component at the intermediate element being effective, by the action of the pair of co-



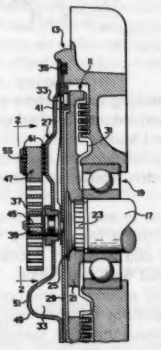
operating ramp surfaces, to produce axial movement of the intermediate element providing a clamping action at the pair of opposed radially extending annular friction-clutch surfaces of the secondary synchronizer element, to provide an additional synchronizing drag torque component which performs the major contribution in bringing the first and second rotary members of the stepped-ratio transmission into rotary synchronism.

4,185,726

FLUID COUPLING DEVICE AND BIMETAL COIL MOUNTING ARRANGEMENT

Douglas D. Rohrer, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 14, 1978, Ser. No. 933,309
Int. Cl.[2] F16D *43/25*
U.S. Cl. 192—58 B **7 Claims**



1. In a fluid coupling device of the type including a first rotatable member defining an axis of rotation, cover means associated with the first member to define a fluid chamber therebetween, a valve plate disposed to separate the fluid chamber into a fluid operating chamber and a fluid reservoir chamber, a second rotatable member disposed in the fluid operating chamber and rotatable relative to the first member, valve means operable to control fluid communication between the operating chamber and the reservoir chamber and including a valve shaft disposed generally axially and extending outwardly through the cover means and being rotatable relative thereto, a bimetal element having a first end portion operatively connected to the valve shaft and a second end portion, the improvement comprising:

(a) a clip member including a portion receiving the second end portion of the bimetal element, and including at least one wing portion oriented generally parallel to the adjacent surface portion of the cover means;

(b) a resilient, elastomeric member surrounding the second end portion of the bimetal element and being in engagement therewith, said elastomeric member having a relatively thin wall;

(c) the second end portion of the bimetal element and said elastomeric member being surrounded, on three sides, by said receiving portion and, on the fourth side, by one of the cover means and said receiving portion;

(d) means for attaching said wing portion to the cover means to define an enclosure; and

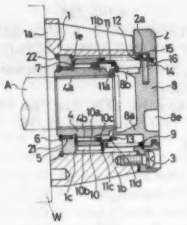
(e) said enclosure being configured to engage the elastomeric member and to compress said elastomeric member against the second end portion on at least two sides thereof.

4,185,727

WHEEL HUB CLUTCHING MECHANISM

Hiroji Yamaguchi, Kariya; Kikuo Kato, Chita, and Tooru Kagata, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 641,816, Dec. 18, 1975, abandoned. This application Sep. 27, 1977, Ser. No. 837,265
Claims priority, application Japan, Dec. 27, 1974, 50-1790
Int. Cl.[2] F16D *11/04, 1/06*
U.S. Cl. 192—89 B **9 Claims**



1. A wheel hub clutching mechanism comprising:

a body member, provided with internal splines adapted to be secured to a wheel hub;

a pinion journalled within said body and adapted to be mounted upon a driven axle, and provided with external splines;

a clutch ring splined to said body and axially movable by resilient means from a free position within which it is disengaged from said pinion to a locked position within which it is engaged with said pinion;

a supporting member secured to said body for bearing said pinion, said supporting member being secured to said body in the rotational direction thereof and axially fitted therebetween;

said splines of said body being disposed substantially parallel to said axle;

said supporting member and said body being arranged so as to prevent relative rotation therebetween and such that said supporting member is a separate member from said body member;

a first and second snap ring secured to said body and said pinion, respectively, for thereby preventing the axial movement of said supporting member;

a metal bushing secured to the inner periphery of said supporting member for thereby bearing said pinion; and

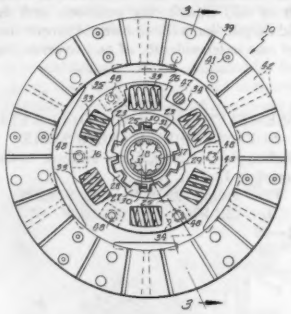
a follower ring splined to said body such that said clutch ring axial movement is performed in one direction by engaging said follower ring.

4,185,728

CLUTCH DISC WITH VARIABLE DEFLECTION RATE VIBRATION DAMPER

Sidney U. Gatewood, Roseville, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 14, 1977, Ser. No. 842,135
Int. Cl.[2] F16D *3/14*
U.S. Cl. 192—106.2 **3 Claims**



1. A vibration damper assembly for a vehicle friction clutch comprising a hub barrel having a central splined opening for connection to a driven shaft, external splines on said hub barrel including a pair of diametrically opposed reduced width external splines, a separate hub flange encompassing said hub barrel and having a plurality of internal splines of constant arcuate dimensions loosely meshing with said external splines, said external and internal splines being so dimensioned as to provide limited frictionless relative rotation between the hub barrel and flange, said flange having a pair of opposed notches defined by said internal splines receiving said reduced width splines therein, a small compression spring received in each notch to yieldably engage a reduced width spline to provide a first stage of damper travel, a clutch driven plate rotatably mounted on said hub barrel and terminating at its outer periphery in oppositely disposed friction facings, a spring retainer plate rotatably mounted on said hub barrel, said clutch driven plate and spring retainer plate sandwiching said hub flange therebetween, stop pins securing said plates together for simultaneous rotation, a plurality of circumferentially spaced axially aligned windows in said plates and hub flange, at least one compression spring received within each set of windows to provide a second stage of angular displacement, said hub flange having a central portion of a greater thickness than the remainder of the flange, the distance between said plates at said stop pins being less than the thickness of the central portion of the hub flange, and axially spaced shoulders on said hub barrel for piloting the clutch driven plate and to provide clearance with the spring retainer plate, the spacing between said shoulders being less than the distance between said plates at the central portion of the hub flange, said central portion frictionally engaging said plates to provide damping friction during said second stage of operation.

4,185,729

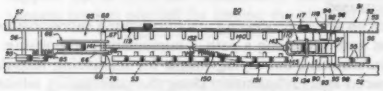
CONVEYOR LOAD SPACER

James H. Obermeyer, Crown Point, Ind., assignor to Interlake, Inc., Oak Brook, Ill.

Filed Nov. 1, 1978, Ser. No. 956,650
Int. Cl.[2] B65G *13/00*
U.S. Cl. 193—35 A **20 Claims**

1. A load spacing mechanism for a load conveyor comprising an actuating member movable between extended and retracted positions responsive to the absence or presence of a load thereon respectively, stop means movable between retracted and extended stop positions, support means movable

between a first position thereof wherein said support means supports said stop means in the extended stop position thereof and a second position thereof wherein said support means does not support said stop means, linkage means interconnecting said actuating member and said support means, movement of said actuating member to the retracted position thereof permitting movement through said linkage of said support means to the first position thereof, movement of said actuating member to the extended position thereof resulting in movement through said linkage of said support means to the second position thereof while said stop means remains stationary in the extended stop position thereof, and means continually urging



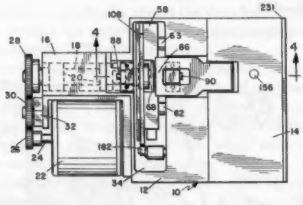
said actuating member to the extended position thereof, whereby when a load is present on said actuating member said actuating member is in the retracted position thereof and said support means is in the first position thereof and said stop means is in the extended stop position thereof to maintain a load stopped thereat and when a load is absent from said actuating member said actuating member is in the extended position thereof and said support means is in the second position thereof and said stop means having a load bearing thereagainst is easily movable to the retracted position thereof and away from the load, thus permitting the load on the conveyor to pass thereover.

4,185,730

MAGNETICALLY ENCODED TOKEN AND HANDLING APPARATUS

John B. Roes, and Royal C. Moore, both of San Diego, Calif., assignors to Cubic Western Data, San Diego, Calif.

Filed Apr. 6, 1978, Ser. No. 894,192
Int. Cl.[2] G07F *3/02*
U.S. Cl. 194—4 R **9 Claims**



1. A token handling apparatus for use with a flat disc token having central aperture and a magnetically encodable peripheral track, the token handling apparatus comprising:

a housing having a front portion and a rear portion; said housing having a token receiver therein, said receiver having a token receiving slot with support means for holding a token therein in an initial position;

detector means on said housing for sensing the insertion of a token into the receiver;

a magnetic read and write head adjacent said receiver;

token holding and rotating means responsive to a token received signal from said detector means for rotating a token over said head to scan the peripheral track;

said token holding and rotating means including a drive shaft rotatably mounted in said front portion and extending longitudinally from front to rear, the rear end of said shaft having a driven face plate thereon adjacent the initial position of a token in said receiver;

said driven face plate being axially slidable on said drive shaft and being biased rearwardly thereon, the rear end of said drive shaft having a centering ball therein normally enclosed by the driven face plate;

a sliding shaft axially slidably mounted in said housing coaxial with said drive shaft, and having a rotatable face plate thereon confronting said driven face plate to hold a token therebetween at the initial position;

actuating means coupled to said sliding shaft for moving said rotatable face plate against said driven face plate with a token therebetween and retracting the driven face plate forwardly to seat the aperture of the token over said centering ball with the token in a scanning position over said head;

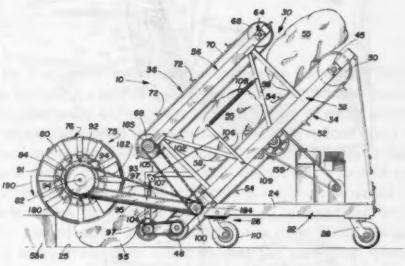
and token ejecting means in said receiver, responsive to data on the peripheral track for ejecting a token from the receiver in one of two directions.

4,185,731

APPARATUS FOR COLLECTING SOLID AND LOOSE-WASTE MATERIALS

Gerhardt Van Drie, 724 W. Pine Ave., El Segundo, Calif. 90245

Filed Mar. 7, 1978, Ser. No. 884,129
Int. Cl.[2] B65G *65/02, 65/16*
U.S. Cl. 198—304 **8 Claims**



1. A waste-material-handling-and-collecting apparatus for picking up both solid and loose-waste materials, said apparatus having a frame structure, an undercarriage, a conveyor system, and an improved self-adjusting pick-up roller which comprises:

a pair of cylinders, spaced apart;

a drive axle having said cylinders removably mounted adjacent each end thereof for rotation therewith;

a plurality of flexible straps secured with and extending between said cylinders, thereby defining a flexible roller;

a flexible sleeve member defining a cover to cover over said straps, said cover being removably mounted to said pick-up roller;

said cover comprises flexible sheet material and a plurality of flexible stay members affixed to said sheet material transversely thereon, whereby said cover is prevented from collapsing;

means for removably mounting said flexible sleeve to said pick-up roller; and

means for adjustably mounting said pick-up roller to said apparatus forwardly of said conveyor system.

4,185,732

ARRANGEMENTS FOR AND METHODS OF IMPROVING AMPUL HANDLING CAPACITY IN AMPUL PROCESSING MACHINES

John F. McMickle, Piscataway, N.J., assignor to Cozzoli Machine Co., Plainfield, N.J.

Continuation-in-part of Ser. No. 769,188, Feb. 16, 1977, Pat. No. 4,096,683. This application Dec. 9, 1977, Ser. No. 859,152
Int. Cl.[2] B65G *47/14, 47/34*
U.S. Cl. 198—455 **32 Claims**

1. In an ampul processing machine, a combination comprising:

(a) means for guiding ampuls along a path, said guiding means including

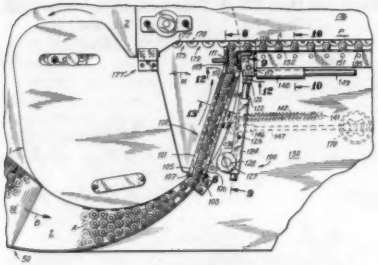
an upstream portion having a predetermined width transversely of the path,

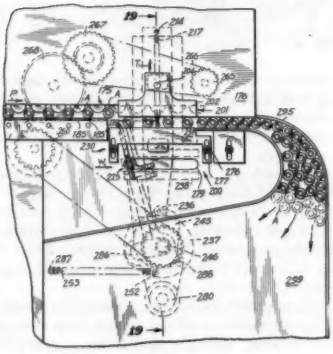
a downstream portion having a transverse width less than the predetermined transverse width of said upstream portion, and

a throat portion intermediate said upstream and downstream portions and having a transverse width less than the predetermined width of said upstream portion but greater than the transverse width of said downstream portion,

said upstream, throat and downstream portions all converging in smooth continuous manner downstream of the path; and

(b) anti-jamming means for preventing ampuls being guided through said guiding means from jamming generally transversely across the path to thereby bridge and block the same, said anti-jamming means including





a movable agitator adjacent said guiding means, and

means for initially moving said agitator in a first direction generally transversely across the path between a retracted position away from the path towards an extended position in which said agitator projects partially transversely across the path to thereby engage ampuls being guided along the same, and for subsequently moving said agitator in a second direction generally upstream of the path while the agitator remains in its extended position from one end operating position adjacent said downstream portion towards another end operating position adjacent said upstream portion to thereby displace ampuls engaged by said agitator in countercurrent direction of the path, whereby ampul jamming and bridging across the path is counteracted.

11. In an ampul processing machine having successive work stations arranged along a path, a combination comprising:

(a) intermittent conveying means for advancing ampuls along the path during advancement time periods in which the ampuls are conveyed from one work station towards the next, and for maintaining the conveyed ampuls within their respective work stations for processing the ampuls during dwell time periods which alternate with said advancement time periods; and

(b) means for continuously feeding at least one ampul to said intermittent conveying means during each dwell time period, and for continuously feeding at least one additional ampul to said intermittent conveying means during each advancement time period to thereby utilize both time periods of each operating cycle of the conveying means, whereby the ampul handling capability of the machine is increased.

23. In an ampul processing machine having successive work stations arranged along a path, a combination comprising:

(a) intermittent conveying means for advancing ampuls in spaced-apart relationship along the path during advancement time periods in which the ampuls are conveyed from one work station towards the next, and for maintaining the conveyed ampuls within their respective work stations for processing the ampuls during dwell time periods which alternate with said advancement time periods; and

(b) means for discharging ampuls from said intermittent conveying means during each dwell time period by initially moving the ampuls to be discharged in their spaced-apart relationship away from the conveying means, and by subsequently moving the ampuls to be discharged to a closed contiguous relationship prior to moving all of the ampuls to be discharged in their contiguous relationship downstream of the path to thereby increase the ampul handling capability of the machine.

4,185,733

TRANSFERRING AND ASSORTING APPARATUS FOR SAWN TIMBER

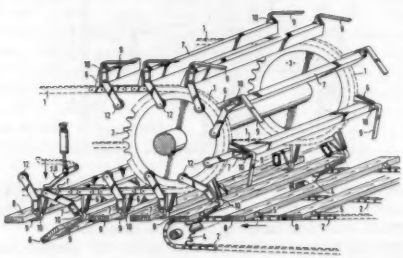
Lennart O. Heikinheimo, Helsinki, Finland, assignor to Plan-Sell Oy, Helsinki, Finland

Filed Oct. 28, 1977, Ser. No. 846,346

Claims priority, application Finland, Nov. 26, 1976, 763418

Int. Cl.[2] B65G *47/34*

U.S. Cl. 198—477 **3 Claims**



1. A transferring and assorting apparatus for sawn timber of the type adapted to remove one piece of timber at a time from a feed conveyor by supporting the piece from below and to transfer and deliver the piece to a predetermined point, comprising:

an endless coveyor movable in a given plane having a longitudinal transfer portion movable in a transfer direction in said given plane;

at even intervals in the longitudinal direction of the endless conveyor, a protrusion fixedly connected to and extending from said conveyor and at least two substantially L-shaped support hooks spaced apart from each other in a direction transverse to said given plane, each hook including an arm which extends from the endless conveyor and having at its outer end a support which in the transferring

position of the hook protrudes in the direction of travel of the transfer portion of said endless conveyor and adapted to be pushed under the piece of timber on said feed conveyor to support the piece from below and transfer the piece to the predetermined delivery point;

each hook being pivoted by an axle for swinging movement about an axis which is transverse to said given plane of movement of the endless conveyor in order to drop the piece of timber;

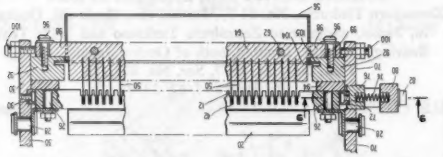
the pivot axle of the support hook being situated at the intersection of the arm and the support, said axle being directly mounted to the outer end of said protrusion such that the distance between the longitudinally spaced apart support hooks does not substantially decrease when a support hook is pivoted for tipping the piece of timber.

4,185,734

ARTICLE COUNTING MACHINE

Charles F. Bross, Chicago, Ill., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Apr. 17, 1978, Ser. No. 897,234
Int. Cl.[2] B65G *47/34*
U.S. Cl. 198—484 **7 Claims**



1. In an article counting machine having a series of elongated slats, means supporting said slats for movement in a closed path in a direction transverse to direction of slat elongation, each of said slats having a multiplicity of spaced cavities provided in an outer wide surface thereof and along length of said slat, said path including cavity charging and article discharging stations and a slat return station after said discharging station, means at said charging station for depositing an article in each of said cavities, means to gradually invert the slats for discharging said deposited articles for counting at said discharging station, the improvement therewith comprising

a slit provided through each of said cavities, said slits having a depth slightly greater than depth of said cavities, said slits aligned with the direction of travel of said slats,

stationary ejector means mounted to said counting machine for operably engaging said slits while said cavities are disposed in a discharging attitude,

a mounting bar fixedly mounted to a side support plate of said machine,

a contactor member,

spring means communicating between said mounting bar and contactor member urging said contactor member away from said mounting bar and against end portions of successive slats as said successive slats travel in said closed path movement to urge said successive slats laterally away from said mounting bar,

guide means cooperating between said mounting bar and contactor member for guiding floating movement of said contactor member when said slats are urged laterally away from said mounting bar,

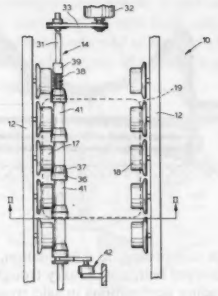
means mounted to opposing side plate of said machine for limiting lateral movement of said successive slats by said contactor member whereby said successive slats are positively positioned for registration of said ejector means with said slits to a depth deeper than bottom of said cavities such that articles wedged in said cavities failing to discharge by force of gravity at said discharging station are ejected from said cavities to prevent a continuous miscount of said articles.

4,185,735

POWERED PAN CONVEYOR

Theodore A. Hammond, 3575 - 52nd St., SE., Kentwood, Mich. 49508

Filed Sep. 15, 1977, Ser. No. 833,585
Int. Cl.[2] B65G *13/071*
U.S. Cl. 198—789 **13 Claims**



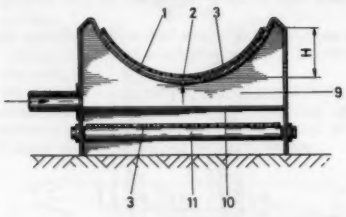
1. In a powered roller conveyor having stationary frame means including a pair of spaced elongated side frames extending longitudinally of the conveyor, a plurality of roller assemblies supported on the frame means and being spaced apart at regular longitudinal intervals, each said roller assembly including axle means mounted on the side frames and a pair of opposed coaxially aligned flanged conveyor wheels mounted on the axle means, the flanged wheels of each opposed pair being axially spaced apart and disposed with their radial flanges facing away from each other so that the conveyor wheels provide points of support for a relatively flat-bottomed object which is to be conveyed along the conveyor, the radial flanges on said wheels providing latera! guidance for the object, and drive means for simultaneously driving at least a group of said roller assemblies, said drive means including an elongated rotatable line shaft extending longitudinally of said conveyor and drivingly connected to motor means, comprising the improvement wherein said axle means includes a pair of coaxially aligned stub shafts which are respectively mounted on and project outwardly from said side frames in cantilevered relationship, the pair of opposed flanged wheels being supported on the pair of coaxially aligned stub shafts, said line shaft extending continuously throughout said group of roller assemblies and being disposed between the flanged wheels defining the opposed pairs, said line shaft being positioned with its rotational axis extending substantially perpendicular to and substantially intersecting the rotational axes of said roller assemblies, the flanged wheels as associated with one of said side frames having substantially axially-directed annular driving surfaces formed on the inner axial end portions thereof, said line shaft including a plurality of radially enlarged hubs spaced axially therealong and having substantially radially-directed peripheral annular drive surfaces extending concentrically of the rotational axis of said line shaft, the annular drive surfaces on said hubs being disposed in direct frictional driving engagement with the annular driving surfaces formed on the inner axial end portions of the flanged wheels associated with said one side frame, said hubs comprising sleeves which concentrically surround said line shaft and have a rotatable slip fit therewith, the engagement of the flanged wheel with the respective sleeve exerting sufficient pressure against the latter so that a rotatable frictional driving engagement is created between said sleeve and said line shaft.

4,185,736

BELT CONVEYOR AND A BELT FOR USE THEREON

Cornelius O. Jonkers, Morshoekweg 5, Hengelo (O), Netherlands

Continuation-in-part of Ser. No. 594,813, Jul. 10, 1975, abandoned. This application Jun. 30, 1977, Ser. No. 811,767
Claims priority, application Netherlands, Jul. 11, 1974, 7409412
Int. Cl.[2] B65G *15/60*
U.S. Cl. 198—811 3 Claims



1. A conveyor comprising, in combination, an endless moving, arcuate conveyor belt, a stationary trough below said belt and means including perforations in said trough for introducing a fluid under pressure between said trough and said belt to support said belt, said belt having longitudinally extending said edges and an arcuate transverse cross-sectional shape in an unsupported and weightless condition being different from the cross-sectional shape of the trough so that in said unsupported and weightless condition the mid-point of said belt between the side edges is at a distance from a straight line through the edges of the cross-section of the belt between 0.2 and 0.8 times this distance if the belt would be in the trough and would follow the shape thereof, said belt being made of a flexible material with a flexibility being between 3 and 5 times the flexibility necessary for the belt if supported along its side edges only by the trough walls to flex in order that said mid-point just reaches the bottom of the trough.

2. A conveyor comprising, in combination, an endless moving conveyor belt, a stationary trough below said belt and means including perforation in said trough for introducing fluid under pressure between said trough and said belt, said belt having longitudinally extending side edges and continuous top and bottom surfaces extending between said side edges, said belt having a transversely extending central portion of greater weight than each of the side portions extending between said central portion and the adjacent side edges of said belt so that a central portion equal to half the width of the belt has a weight of at least 55% and at most 70% of the total weight of the belt, said belt being made of a flexible material with a flexibility being between 3 and 5 times the flexibility necessary for the belt if supported along its side edges by the trough walls to flex in order that the mid-point of said belt between the side edges just reaches the bottom of the trough.

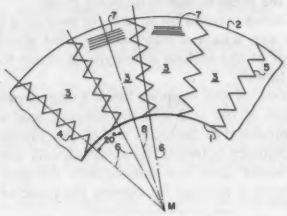
4,185,737

CURVE CONVEYOR BELT AND METHOD AND APPARATUS FOR PRODUCING THE SAME

Karl-Günther Bläättermann, Elchbert 24, 2000 Hamburg-Rahlstedt, Fed. Rep. of Germany

Continuation of Ser. No. 668,683, Mar. 19, 1976, abandoned. This application Sep. 26, 1977, Ser. No. 836,793
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1975, 2512252
Int. Cl.[2] B65G *15/02*
U.S. Cl. 198—831 16 Claims

1. An annular curve conveyor belt of elastomeric material having a center of curvature, said belt including at least one fabric or plastic foil inlay which has its greatest tensile strength in a main direction of tension, the curve conveyor belt being composed of a plurality of sector-shaped pieces with abutting side edges, each having a maximum arc length of 45°, and having the main direction of tension of the inlay or inlays in each piece extending at right angles to a radial beam of the piece, the main direction of tension of each piece being inclined



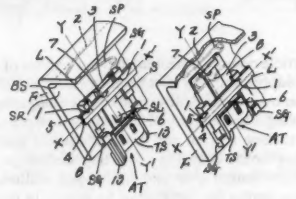
with respect to the main direction of tension of the abutting pieces, the main directions of tension of successive pieces being angularly related as are the sides of a polygon extending about said center of curvature of the curve conveyor belt.

4,185,738

GUIDING DEVICE FOR ENDLESS APRON

Zenzaburo Tsukumo, No. 11-7, Masumi-cho, Ikeda-shi, Osaka-fu, Japan, assignor to Zenzaburo Tsukumo and NTN Toyo Bearing Company, Limited, both of Osaka, Japan

Filed Nov. 14, 1977, Ser. No. 851,173
Int. Cl.[2] B65G *15/62, 23/44*
U.S. Cl. 198—814 9 Claims



1. A tightening and guiding device for guiding an endless apron smoothly in a predetermined path comprising a base plate having a guide means disposed thereon, a sliding base guided by said guide means, a latch member having a latch spring carried by said sliding base, a pressing means provided between said sliding base and a back surface of said base plate, and a locking bar provided on said guide means and being slidable at right angles to said guide means between two positions, wherein in a first position said locking bar retains said sliding base against the action of said pressing means by blocking said latching spring and in a second position said locking bar permits free movement of said sliding base and said latch spring under the influence of said pressing means.

4,185,739

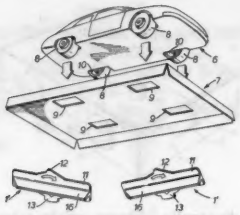
RETENTION OF ARTICLES ON A SHEET

William P. Wilford, Northampton, England, assignor to The Mettoy Company Limited, Northampton, England

Filed May 18, 1978, Ser. No. 907,347
Claims priority, application United Kingdom, May 20, 1977, 21395/77
Int. Cl.[2] B65D *5/52*
U.S. Cl. 206—45.14 7 Claims

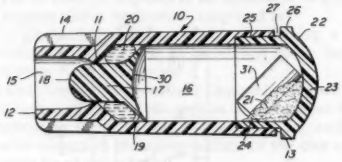
1. An assembly of a toy vehicle on a sheet, wherein said vehicle has wheels defining at least two recesses, said sheet having apertures therein through which said recesses extend, and said vehicle lying substantially on one side of said sheet, the assembly further including retaining means which retains said vehicle against said sheet and which comprises a body

portion located on an opposite side of said sheet relative to said vehicle and at least two projections which extend from said



body portion and respectively engage in said recesses in said wheels.

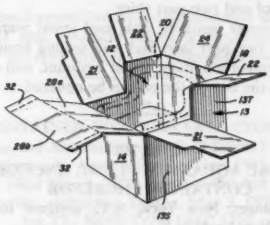
4,185,740
DISPOSABLE CAPSULES
Alan J. Perfect, Allentown, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.
Filed Aug. 2, 1978, Ser. No. 930,343
Int. Cl.[2] B65D *81/32*
U.S. Cl. 206—220 **14 Claims**



1. A disposable capsule comprising (1) a hollow cylindrical section, said hollow cylindrical section having an axially located shoulder spaced from the ends of the cylinder such that the internal diameter of such cylinder at a point spaced from its ends is thereby provided with a constriction; (2) a plug being detachably secured to the lower end of said hollow cylindrical section; and (3) an insert comprising a stem having an upper portion which is inserted through and frictionally engages said constriction and a flange extending outwardly about the lower end of said stem, said flange being spaced from said shoulder and said plug and being frictionally engaged with the inner wall of said hollow cylindrical section along the entire periphery thereof, whereby said cylinder and said plug forms a mixing chamber and said flange divides said mixing chamber into two non-communicating chambers.

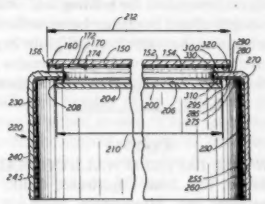
4,185,741
SHIPPING CONTAINER AND BLANK THEREFOR
Robert A. Schiff, Jackson, and John T. Holladay, Pinson, both of Tenn., assignors to Packaging Corporation of America, Evanston, Ill.
Filed Feb. 21, 1978, Ser. No. 879,090
Int. Cl.[2] B65D *85/64*
U.S. Cl. 206—326 **3 Claims**

1. A shipping container formed from a single substantially rectangularly shaped blank of foldable sheet material for accommodating an article having the upper portion thereof with a stepped profile, said container comprising a bottom for subtending and supporting the article; an upright back panel connected to said bottom and being positionable adjacent the back of the accommodated article; a pair of upright side panels foldably connected to opposite side edges of said back panel and extending angularly therefrom, said side panels being connected to said bottom and being positionable adjacent the sides of the accommodated article, the upper end of each side panel having front, intermediate and back edges connected to form a stepped configuration adapted to conform substantially to the accommodated article stepped profile, the back edge being elevated relative to said front edge, the lengths of said front and back edges combining to define substantially the depth of the container; an upright front panel connected to said bottom and having opposite side edges thereof foldably connected to said side panels and defining substantially the width of the container, said front panel being positionable adjacent the front of the accommodated article; a pair of first top closure flaps foldably connected at said front edges of the side panel upper ends and being adapted to overlie a first portion of the accommodated article; a pair of second top closure flaps



foldably connected to the back edge of the side panel upper ends and being adapted to overlie a second portion of the accommodated article; a third top closure flap foldably connected to the upper edge of said back panel and terminating with a free edge and overlying the second top closure flaps; a fourth top closure flap foldably connected to the upper edge of said front panel, said fourth top closure flap including a first section overlying said first top closure flaps and a second section foldably connected to said first section and terminating with a free edge and spanning the distance between the intermediate edge of the side panel upper ends, and laterally extending ears foldably connected to opposite edges of said second section and secured to surface portions of said side panels adjacent the intermediate edge of said side panel upper ends.

4,185,742
COIL COVER
Dwight Fisk, Appleton, and Willis P. Drew, Green Bay, both of Wis., assignors to Straubel Paper Company, Green Bay, Wis.
Filed Oct. 4, 1978, Ser. No. 948,567
Int. Cl.[2] B65D *85/66*
U.S. Cl. 206—414 **9 Claims**



1. A coil cover for covering the end of a cylindrical roll of sheet material comprising:

a two-part cylindrical skirt of a selected height and interior diameter having an exterior layer of a first unstretched paper sheet material bonded to an interior layer of plastic film,

an interior disk of a selected sheet stock having a selected diameter;

an exterior disk of a selected sheet stock having a diameter a selected amount greater than said diameter of said interior

disk and a selected amount smaller than said interior diameter of said two-part skirt;

each said disk being treated so as to be resistant to the passage of moisture therethrough;

a circumferential region of a first end of said two-part cylindrical skirt being formed substantially perpendicular to said skirt and extending inwardly with respect thereto;

a circumferential region of an inner planar surface of said exterior disk being sealingly bonded to an external region of said inwardly extending circumferential region of said first end of said two-part skirt;

a circumferential region of an outer planar surface of said interior disk being sealingly bonded to an internal region of said inwardly extending circumferential region of said first end of said two-part skirt;

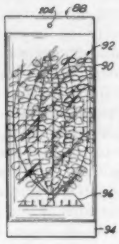
said outer, water resistant, disk, said inner, water resistant disk, said two-part skirt and said sealing bonds therebetween forming a unitary, water resistant, coil cover slidable onto the end of the coil to be covered.

4,185,743

ARTIFICIAL AQUARIUM PLANT, ANCHOR AND CONTAINER THEREFOR

Allan H. Willinger, New York, N.Y., assignor to Willinger Bros., Inc., New York, N.Y.

Filed May 30, 1978, Ser. No. 910,466
Int. Cl.² B65D *85/54*
U.S. Cl. 206—423 **24 Claims**



19. In combination, an artificial aquarium plant and a package therefor, said artificial aquarium plant comprising a narrow elongated anchor, a plant member simulating a natural plant, and coupling means for centrally connecting said plant member to said anchor in a T-connection; the package comprising an elongated container for holding said artificial aquarium plant, the length of said container being sufficient to retain said plant member, and the width being slightly larger than the length of said anchor, whereby said anchor retains the shape of the package to prevent crushing of said plant member.

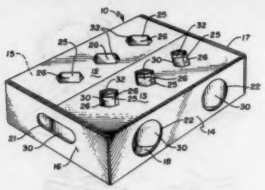
4,185,744

CARTON FOR TAPERED WALL CONTAINERS

Bertel R. Peterson, San Juan Capistrano, Calif., assignor to FBM International, Inc., Minneapolis, Minn.

Filed Dec. 15, 1978, Ser. No. 969,808
Int. Cl.² B65D *75/00*
U.S. Cl. 206—427 **5 Claims**

1. A carton for carrying a plurality of articles, each of which has a flanged projecting portion located near its upper extremity, said carton comprising spaced top, bottom, and side panels, and article restraining locks comprising pairs of downwardly foldable flaps struck from said top panel with the lower edges of each pair of said flaps being struck from said top panel along a line adjoining the vertical center line of a pair of diagonally adjacent articles loaded in said carton, the side edges of said flaps being angled relative to said line to permit engagement of each side edge with both the flanged portion and the side wall



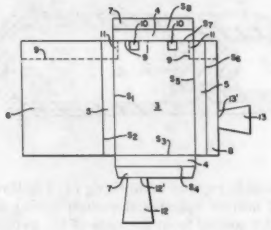
of one of said diagonally adjacent articles when said flaps are downwardly folded.

4,185,745

SHEET PACKAGING ARRANGEMENT

Kurt Moser, Gerlingen, and Heinrich Kaufmann, Stuttgart, both of Fed. Rep. of Germany, assignors to Fa. Develop KG, Dr. Eisbein and Co., Fed. Rep. of Germany

Filed Apr. 4, 1977, Ser. No. 784,378
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1976, 2614530
Int. Cl.² B65D *5/72*
U.S. Cl. 206—556 **10 Claims**



1. An arrangement for packaging sheets, characterized in that the arrangement includes a container for accommodating a predetermined number of sheets to form a stack of sheets, said container surrounds and is adapted to the contour of the stack of sheets and includes a top wall member, bottom wall member, a pair of spaced side wall members, and a pair of spaced end wall members, said top wall member terminating in a free edge spaced from one of said end wall members, a fishplate means is arranged on one of said end wall members which extends over the space between said one of said end wall members and said free edge, said fishplate means being insertable beneath said free edge of said top wall member so as to close the container, at least one notch is provided in each side wall member for uncovering lateral side portions of a stack of sheets, each of said notches extends from one of said end wall members over a distance at least corresponding to the space between said one of said end wall members and said free edges, at least one further notch is provided in said bottom wall member for uncovering a portion of an underside of a stack of sheets, and in that separating means are arranged on and extend transversely of the bottom wall member at a predetermined distance from said last-mentioned end wall member such that, upon a separation of the container along the separating means, said fishplate means, said last-mentioned end wall member, and a strip of said bottom wall member are removed from the container such that a portion of an upper side of a stack of sheets, lateral side portions of a stack of sheets adjacent the at least one notch provided in each of said side wall members, an underside of a stack of sheets adjacent the at least one further

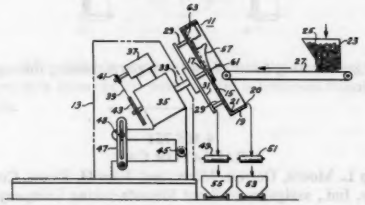
notch in said bottom wall member, and the forward edges of a stack of paper are exposed.

4,185,746

PARTICULATE SIZE SEPARATOR AND METHOD OF OPERATING

Lloyd V. Fegan,Jr., Allentown, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Dec. 1, 1977, Ser. No. 856,816
Int. Cl.[2] B07C *9/00*
U.S. Cl. 209—691 **19 Claims**



1. A particulate size separation device comprising:
(a) a substantially circular separator rotatably mounted with its axis of rotation disposed at an inclination of from 15 to 40 degrees above horizontal comprised of:
(i) a substantially planar bottom disk having a central orifice and disposed at an inclination above horizontal of from 50 to 75 degrees,
(ii) a sidewall circumferentially disposed completely about at least a portion of the surface of said planar disk and extending from the disk substantially perpendicularly with respect to the upper surface of the disk to a free outer lip of the sidewall,
(iii) the lower edge of the central orifice in the planar bottom disk being positioned at a higher elevation than the lowermost position of the outer lip of the sidewall,
(b) a scraper mounted in close proximity to the surface of said planar bottom disk and extending from an upper portion of said sidewall to near the downwardly moving edge of said central orifice,
(c) drive means for rotating said separator,
(d) first collecting means disposed adjacent to the central orifice for receiving relatively fine particulates passing through the central orifice,
(e) second collecting means disposed adjacent to the outer lip of the sidewall at substantially the lowermost position of said lip for collection of relatively coarse particulates passing over the lip, and
(f) feeding means for feeding particulate material to the separator.

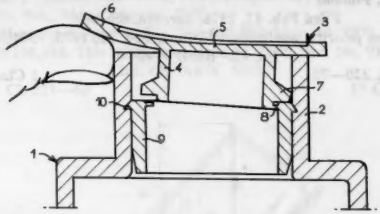
4,185,747

BOTTLE STOPPER WITH INVIOLABILITY DEVICE

Antonin L. Goncalves, Groslay, France, assignor to L'Oreal, Paris, France

Filed Mar. 14, 1977, Ser. No. 777,142
Claims priority, application France, Apr. 6, 1976, 76 09956
Int. Cl.[2] B65D *41/32*
U.S. Cl. 215—253 **10 Claims**

1. In a stopper for closing the neck of a container, said stopper having a part adapted to be situated outside the container and provided with a prehensile device on which the user may pull to rupture an inviolability device associated with the stopper, said stopper further comprising a skirt which is connected near its lower edge to a peripheral frangible wall forming said inviolability device and by said frangible wall to a retaining sleeve adapted to be located inside the container, the improvement according to which said skirt is provided with a peripheral protective rib positioned adjacent the edge by which the retaining sleeve is connected to said skirt, so that during the insertion of the stopper into the neck of the container the protective rib bears on the retaining sleeve and in



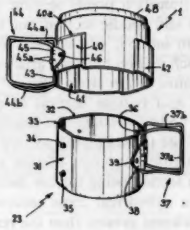
which peripheral protective rib is discontinuous and comprises a plurality of pins generally regularly positioned about the periphery of the skirt adjacent the retaining sleeve.

4,185,748

CONTAINER FOR PORTABLE STOVE

Marcel Vache, and Antoine Ferra, both of Sainte Foy Les Lyon, France, assignors to Application Des Gaz, Paris, France

Filed May 1, 1978, Ser. No. 901,868
Claims priority, application France, May 3, 1977, 77 14626
Int. Cl.[2] B65D *7/24*; F24C *5/20*
U.S. Cl. 220—8 **5 Claims**



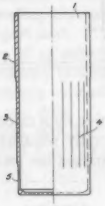
1. An improved container for enclosing a stove which has multiple different assembled configurations including a fully assembled configuration having a relatively greater height and a partially dismantled configuration having a relatively lesser height, and the container including inner and outer saucepan covers operative to telescope one within the other with closed ends facing each other to provide a container having multiple different heights to receive said stove, and further including latch means for latching together the two saucepan covers in selected ones of said different heights, the improvements comprising:
a series of male latch elements each corresponding with one of said different heights of the container, the male elements being attached to one of said saucepan covers and being vertically aligned one above the other along the sidewall of said one saucepan cover and being vertically spaced by difference between said respective stove heights; and
a female latch element attached to the other of said saucepan covers and operative to latch selectively with one of said male elements when the covers are telescoped together to provide a container having one of said multiple heights, the contours of the sidewalls of the saucepan covers in the vicinity of the latch elements being shaped to define an interspace therebetween within which the higher male element when disengaged from said female element can move without snagging, thereby permitting said female element to engage a male element of lesser height when said saucepan covers are telescoped further together.

4,185,749

CAN BODY FOR AN AEROSOL CONTAINER

Matti Vartia, Helsinki, Finland, assignor to Printal Oy, Helsinki, Finland

Filed Feb. 17, 1976, Ser. No. 658,607
Claims priority, application Finland, Feb. 21, 1975, 750495
Int. Cl.[2] B65D *7/42*
U.S. Cl. 220—72 **1 Claim**



1. An aluminum can body for use with an aerosol container being formed of a plurality of distinct contiguous sections defined by a base; a bottom section extending upwardly from said base being integral therewith; a middle section extending in turn upwardly from said bottom section; a mouth section extending in an upwardly direction from said middle section; each of said respective sections being of constant thickness except at definable transition points serving to separate said bottom section from said middle section, and said middle section from said mouth section; said respective sections being further defined by each section having a greater thickness than its neighbor for an entire length along a line of travel from the lowermost point of said bottom section to the top of said mouth section, said body including: an interior wall surface extending from said base to said mouth section at its terminus, being uniformly cylindrical in cross section and of constant diameter; said mouth section being further defined by an exterior surface having a cylindrical cross section for its entire length and a wall thickness greater than the remainder of any of the sections comprising said body; said middle section extending between said mouth and bottom sections respectively and forming a regular polygon therebetween having an outer diameter at its greatest dimensions smaller than or equal to the outer diameter of said mouth section; and said bottom section exterior having a cylindrical cross section for its entire length and a wall thickness smaller than that of the remainder of the portions forming said can body.

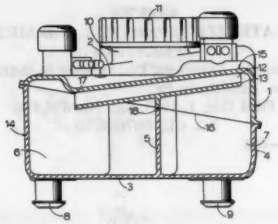
4,185,750

RESERVOIRS FOR MASTER CYLINDERS

Lutz E. A. Op den Camp, Koblenz, Fed. Rep. of Germany, assignor to Girling Limited, Birmingham, England

Filed Dec. 20, 1978, Ser. No. 971,116
Claims priority, application United Kingdom, Dec. 20, 1977, 52867/77
Int. Cl.[2] B65D *1/24, 85/00;* F15B *7/10*
U.S. Cl. 220—20.5 **8 Claims**

1. A reservoir for an hydraulic master cylinder comprising a container of synthetic plastics material for hydraulic fluid, an upstanding partition dividing said container into two chambers, and a wall defining a longitudinally extending passage for providing restricted communication between said chambers, said passage projecting into each said chamber by a substantial distance wherein said container is constructed from two parts and said partition and said wall are formed integrally with said two parts, said wall being integrally formed wholly with one of said parts and the said one part being so constructed and arranged that a projected area of at least one end of said passage lies outside at least one edge of the said one part with which it



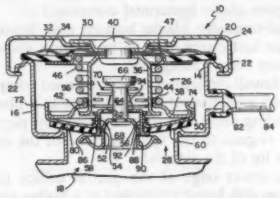
is integral, mating faces of said two parts passing through said partition.

4,185,751

RADIATOR CAP

Phillip L. Moore, Detroit, Mich., and John H. Evans, Connersville, Ind., assignors to Stant Manufacturing Company, Inc., Connersville, Ind.

Filed Jul. 31, 1978, Ser. No. 929,655
Int. Cl.[2] B65D *51/16*
U.S. Cl. 220—203 **12 Claims**



10. A radiator cap comprising a pressure valve member and, centrally within said member, a ferrule providing a pressure-vacuum vent valve passageway, a valve seat, a valve member movable relative to said valve seat to control said passageway, and a spring for yieldably positioning said valve member axially in said passageway, said spring supporting said valve member away from said valve seat when the radiator is at atmospheric pressure to provide a first predetermined flow restriction in said passageway, increased pressure differential across said valve member when the radiator is at higher pressure increasing the flow restriction in said passageway by movement of said valve member, and increased pressure differential across said valve member when the radiator is at lower pressure reducing the flow restriction in said passageway by movement of said valve member.

4,185,752

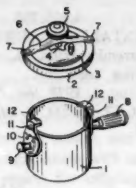
PRESSURE COOKER LID FASTENING MEANS

Pedro Basile, Rua Basile, 132, Sao Paulo, Brazil

Filed Feb. 21, 1978, Ser. No. 879,160
Claims priority, application Brazil, Aug. 8, 1977, 7705242
Int. Cl.[2] B65D *45/23*
U.S. Cl. 220—314 **1 Claim**

1. A pressure cooker including a receptacle open at the top, a lift-off lid to close said receptacle, said lid including a depending peripheral lip for engaging over the top of said receptacle, a pair of brackets removably fixed to said receptacle at diametrically opposite locations thereon, said brackets having extensions which project inward over the top of said receptacle sufficient distances to allow lateral removal of the lid but preventing the vertical removal thereof, a sleeve projecting up from the top of said lid at the center thereof and locking means reacting between said lid and said brackets to press the lid

down against the receptacle top, said locking means including a bar for spanning the distance between said brackets, an axle threaded into said bar at the center thereof, said axle being



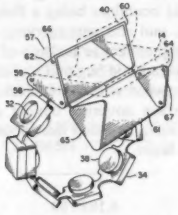
dimensioned for slidable engagement in said sleeve so that the bar is separable from the lid when the lid is removed from the receptacle.

4,185,753

DEVICE FOR DISPENSING END WRAPS

Maria J. Leto, Ramsey, N.J., assignor to Poly Pak, Inc., Ramsey, N.J.

Filed Aug. 22, 1977, Ser. No. 826,346
Int. Cl.[2] B65D *5/72*
U.S. Cl. 221—45 **12 Claims**



1. A device for individually dispensing a plurality of flexible sheets comprising,

(a) a base member;

(b) a pair of primary triangular face members extending upwardly from opposite sides of said base member;

(c) a pair of side members each extending upwardly from said base member between and along the sides of said triangular face members, said side members substantially joining at the apex of each of said triangular face members to form a container of triangular cross-section having an opening between said side members for removal of a flexible sheet; at least one of said side members being hingedly attached to said base member for loading said container with sheets; wherein the width of said base is substantially less than the width of a flexible sheet and the perpendicular distance from said base to the apex of each of said triangular face members is sufficient to maintain said sheets stored within said container in a substantially arched triangular configuration;

(d) a solid projection extending outwardly from said base; and

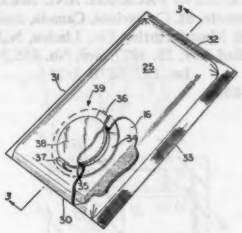
(e) a flexible member adapted to fit around at least a portion of the human arm having at least one recessed indentation adapted to accept said solid projection in close fit therewith.

4,185,754

COLLAPSIBLE RECLOSEABLE DISPENSER PACKET WITH TWO PART RESEALABLE CLOSURE

Robert P. Julius, New York, N.Y., assignor to Nice-Pak Products, Inc., Mount Vernon, N.Y.

Continuation-in-part of Ser. No. 668,682, Mar. 19, 1976, Pat. No. 4,156,493. This application Jun. 13, 1978, Ser. No. 915,013
Int. Cl.[2] A47K *10/20*
U.S. Cl. 221—63 **17 Claims**



1. A disposable moisture impermeable "limp-pack" package for containing and dispensing moisture impregnated moisture impregnated towelettes comprising:

at least one thin sheet of "limp-pack" flexible material, having an opening defined therein, being hermetically sealed to define a container completely enclosing said towelettes,

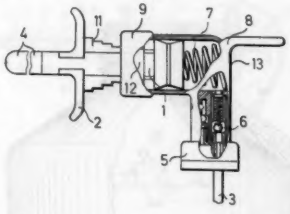
means for capping said opening in said flexible material and providing a moisture impermeable resealable closure for accessing and removing said towelettes contained in said package, wherein said capping means includes a resealable cap, a hinge portion and a circumferential collar, wherein said hinge portion attaches said cap to said circumferential collar and further wherein said collar is permanently mounted on said thin sheet of flexible material at said opening to provide a moisture impermeable seal therebetween.

4,185,755

ADJUSTABLE DOSE PISTOL-TYPE APPLICATOR

Hermann W. Sachs, Leverkusen, Fed. Rep. of Germany; Peter Marek, Ciudad de Guatemala, Guatemala, and Florian Dorner, Dusseldorf, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 10, 1977, Ser. No. 805,557
Int. Cl.[2] G01F *11/00*
U.S. Cl. 222—43 **2 Claims**



1. In a pistol applicator for use in veterinary or botanical fields and the like and having a piston operator and a handhold which are drawn towards each other during application and a piston cylinder housing, wherein the improvement comprises adjustable dose-regulating means including a dose-regulating wheel fixed to the cylinder housing and rotatable about the longitudinal axis of the cylinder housing and means defining a plurality of notches in the wheel, each having a different radial

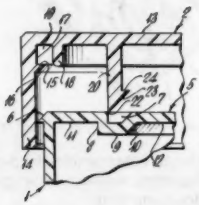
extent and an outwardly tapering stepped crosspiece attached to the piston operator and insertable in one preselected notch at a time, wherein one step of the crosspiece is engageable with the means defining a preselected one of the notches when the piston operator is drawn towards the handhold to limit the stroke of the piston operator and thereby regulate the dose applied.

4,185,756

DISPENSING PACKAGE AND METHOD

Philip A. Sciamonte, St. Catharines, Canada, assignor to American Flange & Manufacturing Co., Linden, N.J.

Filed Nov. 28, 1977, Ser. No. 855,209
Int. Cl.[2] B67B 7/24
U.S. Cl. 222—83.5 **6 Claims**



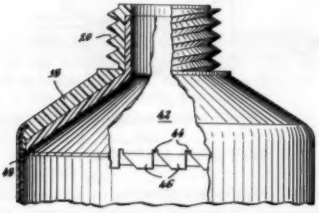
1. A dispensing cartridge and closure combination for holding nonflowable substances comprising, a tubular cartridge body molded of synthetic plastic, said tubular body having an open end and a closed end, a severable panel integrally formed in said closed end, a severing zone structurally formed in said closed end surrounding said panel, a closure member fitted to said body open end for sealing off said open end and directly containing said nonflowable substance within said cartridge, said closure member having a disc like center panel surrounded by a cylindrical sidewall, severing means formed on said closure member for cooperative engagement within said severing zone and means formed on said closure member for retaining said severable panel thereon whereby said closure member may be removed from said cartridge body open end and employed to remove said severable panel intact from said cartridge body closed end.

4,185,757

COLLAPSIBLE DISPENSING TUBE HAVING AN ANCHORED BARRIER MEMBER

Robert S. Schultz, 7 Heusted Dr., Old Greenwich, Conn. 06870

Filed Jul. 8, 1977, Ser. No. 814,323
Int. Cl.[2] B65D 35/10
U.S. Cl. 222—107 **12 Claims**



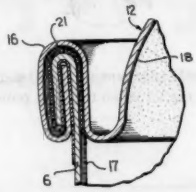
3. A collapsible container having a tubular body, a thermoplastic headpiece molded to one end thereof, an impermeable barrier member fixed to the inner wall surface of said headpiece and provided with an extreme peripheral edge that engages the adjacent inner wall of said tubular body, and a plurality of spaced openings in the lower portion of said barrier member which perforate the latter, said spaced openings having thermoplastic material therein whereby said barrier member, headpiece and tubular body are securely anchored together.

4,185,758

COMPARTMENTALIZED AEROSOL CONTAINER

Earl D. Giggard, Clarendon Hills, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Aug. 1, 1978, Ser. No. 930,097
Int. Cl.[2] B65D 35/14, 35/28
U.S. Cl. 222—386.5 **6 Claims**



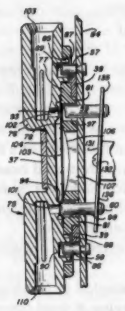
1. A compartmented container comprising a metal container body, a separately formed metal end unit and a plastics material bag, said end unit being joined to said body by a folded seam including folded portions of both said end unit and said body, said bag having an open end portion entrapped in said folded seam and being subject to rupture in the formation of said seam, and said end unit having an inner surface covering bonded to said bag within said folded seam, said bag and said inner surface covering within said folded seam forming a gasket for said folded seam and forming a seal between said bag and said body, said container being a fluid pressure type dispensing container, said end unit carrying a dispensing valve, said container being subject to leakage of a pressurizing fluid between said body and said bag and a product under pressure within said bag between said bag and said end unit, said bag and said inner surface covering having opposed contacting surfaces, and said surfaces being heat bonded together in situ within said folded seam.

4,185,759

FLUID-FLOW LIMITING APPARATUS FOR USE WITH INTRAVENOUS-SOLUTION ADMINISTERING EQUIPMENT

Nick Zissimopoulos, Schaumburg, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Feb. 17, 1978, Ser. No. 878,970
Int. Cl.[2] A61M 5/14
U.S. Cl. 222—450 **46 Claims**



1. An apparatus for delivering controlled amounts of fluid

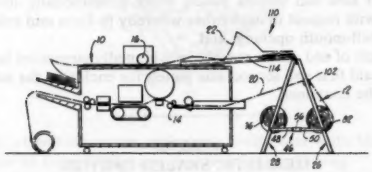
through a flow path, which comprises: a separate casette defining said flow path, said casette defining metering means for holding a predetermined volume of fluid; closable inlet means in fluid communication with said metering means for permitting the flow of a fluid into said metering means; and closable outlet means in fluid communication with said metering means for permitting the flow of a fluid out of said metering means; and a controller adapted to receive said casette, having inlet-controlling means for closing said inlet means and outlet-controlling means for closing said outlet means and first means for receiving and holding said casette at a position remote from said inlet and outlet controlling means, and second means for moving said casette into engagement with said inlet and outlet controlling means, said means for moving the casette into engagement with the inlet and outlet controlling means comprising transporting means which includes (i) a pin rotatable in a path defining half the circumference of a circle, and (ii) a slot defined in the said means for receiving and holding said casette; said slot being positioned in a direction normal to the direction of motion of said casette into engagement with the inlet and outlet controlling means, whereby upon rotation of said pin through the half circumferential path, said pin moves from one end to the other of the slot and at the same time moves said means for receiving and holding said casette in a direction generally parallel to the diameter between the ends of said half circumferential path.

4,185,760

SYSTEM FOR FEEDING ELONGATED DOCUMENTS TO REPRODUCING APPARATUS

Thomas A. McNew, 5909 N. Harvard Dr., Oklahoma City, Okla. 73122

Filed May 22, 1978, Ser. No. 907,922
Int. Cl.[2] B65H *17/42, 17/46*
U.S. Cl. 226—109 **15 Claims**



1. An apparatus for feeding and copying elongated documents comprising:

a reproducing machine;

a vertically extending A-frame having a pair of opposed sides hingedly connected to each other for pivotation from a substantially parallel status to a divergent status;

a roll supporting element mounted on one side of said A-frame for rollably supporting a roll of copy paper on the A-frame;

means on the A-frame for guiding copy paper from a roll of copy paper on the A-frame into said reproducing machine; and

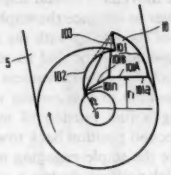
a paper feed tray having an end detachably connected to the upper end of said A-frame and an end supported on said reproducing machine for feeding elongated indicia-carrying documents to said reproducing machine at a location above the location at which said copy paper is fed into said reproducing machine.

4,185,761

PRESSURE ROLLER IN SPINNING MACHINE

Tsutomu Miyazaki, Kariya, and Yoshihisa Suzuki, Chiryu, both of Japan, assignors to Kabushiki Kaisha Toyada Jidoshokki Seisakusho, Aichi, Japan

Filed Nov. 27, 1978, Ser. No. 965,247
Claims priority, application Japan, Nov. 25, 1977, 52-141745; Nov. 25, 1977, 52-158527[U]
Int. Cl.[2] B65H *51/10*
U.S. Cl. 226—181 **6 Claims**



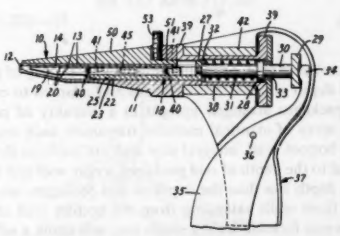
1. A pressure roller disposed between a yarn discharge portion of a spinning unit and a yarn oscillating device of a winding unit in a spinning machine, the pressure roller being in contact with a drive roller to form a nip therebetween and formed with a notch provided in one end edge of the pressure roller to transport the yarn into the nip, the notch intersecting the end face of the pressure roller at boundary lines extending from the end edge thereof inwardly, characterized in that one of the boundary lines provided on the downstream side of a rotational direction of the pressure roller comprises at least two portions extending out of line, and that distances between tangential planes to the two portions of the one of the boundary lines and planes parallel to the tangential planes and including a center of the pressure roller are so selected that the distance with respect to the portion including the outermost end of the one of the boundary lines is larger than that with respect to the portion including the innermost end of the one of the boundary lines.

4,185,762

MEDICAL STAPLING DEVICE

Harold E. Froehlich, St. Anthony, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 27, 1978, Ser. No. 890,682
Int. Cl.[2] B25C *5/06*
U.S. Cl. 227—138 **5 Claims**



1. In a stapling device for suturing tissues with metal staples including a frame, an anvil mounted on said frame, and means for moving a plurality of open staples along a track and sequentially into engagement with said anvil to clinch the staple engaging the anvil, the improvement wherein said means for moving comprises:

a driver mounted on said frame for movement along a predetermined path generally aligned with said track between

first and second positions with said driver more closely adjacent said anvil in said second position;

a staple engaging member comprising a plurality of spaced lugs adapted to engage staples along said track; and

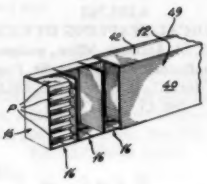
means for mounting said staple engaging member to cause movement of said staple engaging member from an initial position with its lugs spaced from staples along said track toward said track to an engage position with said lugs engaging staples along said track during a first position of movement of said driver from its first toward its second position; to cause movement of said staple engaging member with said driver to advance the staples along the track and engage one of the staples with the anvil to close the staple during a second portion of its movement toward said second position; to cause movement of said lugs away from said track and out of engagement with staples along said track during a first portion of movement of said driver from its second position back toward its first position; and to move the staple engaging member with said driver to its initial position during a second portion of movement of said driver back towards its first position.

4,185,763

CONTAINER WITH OVERWRAP

Joseph G. Geraedts, Agincourt, Canada, assignor to General Foods, Limited, Canada

Continuation of Ser. No. 858,611, Dec. 8, 1977, abandoned, which is a continuation of Ser. No. 616,826, Sep. 25, 1975, abandoned. This application Nov. 30, 1978, Ser. No. 964,988
Claims priority, application Canada, Jul. 4, 1975, 230827
Int. Cl.[2] B65D *03/24, 05/48*
U.S. Cl. 229—15 **6 Claims**



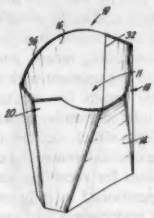
1. A combined shipping and display tray assembly of predetermined depth and width dimensions and adapted to contain flexible packages arranged upright in a plurality of parallel rows, an array of identical modular tray units, each tray unit having a bottom wall, integral side walls of uniform depth at least equal to the depth of said packages, a rear wall and a front wall of a depth less than the depth of said packages, said side, rear and front walls extending from the bottom wall at right angles thereto forming from a single tray unit blank a self-contained modular display unit, each unit having depth and length dimensions equal to the depth and width dimensions of said tray respectively and the length of said tray being a multiple of the width of each tray unit, each unit being attached along its side wall to the side wall of an adjacent unit forming the display tray, and adapted to supportively contain a row of said packages prior to being so attached, and a removable overwrap extending about the display tray forming a closed, stackable, load-bearing, shipping container with the display tray.

4,185,764

SNAP-UP BOTTOM, FLAT FOLDED SCOOP-TYPE CARTON

Raymond A. Cote, Taylorville, N.C., assignor to Champion International Corporation, Stamford, Conn.

Filed Nov. 6, 1978, Ser. No. 958,185
Int. Cl.[2] B65D *5/36, 5/08*
U.S. Cl. 229—16 R **8 Claims**



1. A flat folded, snap-up bottom type container capable of being erected into a generally hollow, conical configuration having an enlarged bell-mouth opening, comprising:

a generally elongate, polygonally shaped bottom panel forming one end of said container and having a pair of intersecting score lines therein;

first and second opposed side panels respectively hingedly connected to opposite elongate edges of said bottom panel and extending upwardly away from the latter toward the other end of said container,

said second side panel including a pair of opposed lateral edges converging toward each other in a direction away from said bottom panel to form a generally isosceles triangularly shaped configuration having the base thereof adjacent said bottom panel and the vertex thereof adjacent said other end of said container,

said first side panel including a pair of opposed lateral edges diverging away from each other in a direction toward said other end of said container to form a generally isosceles triangularly shaped configuration having the base thereof adjacent said other end of said container and the vertex thereof adjacent said bottom panel,

said first and second panels being geometrically inverted with respect to each other whereby to form said enlarged bell-mouth opening; and

a pair of end panels respectively hingedly connected both to said first and second side panels for enclosing the sides of the container.

4,185,765

HERMETIC SEALED CARTON

Edwin C. McLaren, Apple Valley, Minn., assignor to Champion International Corporation, Stamford, Conn.

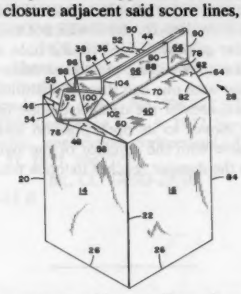
Filed Jul. 24, 1978, Ser. No. 927,338
Int. Cl.[2] B65D *5/72, 5/02*
U.S. Cl. 229—17 G **2 Claims**

1. In a carton of the type having a generally rectangular cross-section with four side walls, a bottom closure and a top closure including a double walled fin formed by a face-to-face joinder of the outer portions of two opposed top closure flaps extending from opposed side walls and triangular panels forming two closure flaps extending from the other opposed walls, the improvement comprising:

a. means joining said walls forming the fin only at the base thereof in a face-to-face relationship whereby said fin may be folded flat on either side thereof, and

b. opposed angled score lines positioned in said fin walls beginning at a common point adjacent said base of said fin and diverging therefrom to terminate at the upper edge of said fin, each said fin further including an additional score line bisecting said opposed angled score lines such that

when upward pressure is applied to said triangular panel of said top closure adjacent said score lines, said fin walls



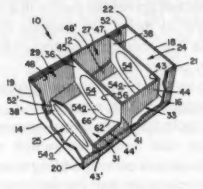
partially separate at said score lines above said joining means to allow easy access for fully separating said fin walls.

4,185,766

TWO BULB CARTON

Thomas L. Davidson, Uncasville, and Robert A. Hackenberg, East Lyme, both of Conn., assignors to Robertson Paper Box Co., Inc., Montville, Conn.

Filed Jan. 12, 1979, Ser. No. 3,543
Int. Cl.[2] B65D *5/02, 85/42*
U.S. Cl. 229—39 B **7 Claims**



1. In a two bulb carton of the type having four walls hinged together to form a tube, the improvement comprising

A. a first generally U-shaped partition structure situated at one end of the tube, said partition structure including a pair of partition panels spaced from and parallel to a first pair of said walls, so as to define a first pair of compartments at said one end of the tube,

B. a second partition structure positioned adjacent the opposite end of the tube, said second partition structure including a pair of partition panels spaced from and parallel to said pair of walls so as to define a second pair of compartments at the other end of the tube, said partition structures being positioned in the tube with reverse symmetry so that the compartments at one end of the tube are in line with their opposite numbers at the other end of the tube, and

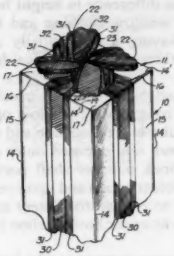
C. means defining relatively large openings in said partition panels so that a pair of bulbs or other bulbous articles inserted into the corresponding compartments at opposite ends of the tube and projecting into the aligned compartments at the opposite ends of the tube will be received and retained in said openings.

4,185,767

ORNAMENTAL PACKAGE STRUCTURE

John M. Sykora, Chicago, and Theodore W. Pollack, Streamwood, both of Ill., assignors to Field Container Corporation, Elk Grove Village, by said John M. Sykora and Mogen David Wine Corporation, Chicago, both of, Ill., by said Theodore W. Pollack

Filed Jul. 12, 1978, Ser. No. 923,978
Int. Cl.[2] B65D *5/10*
U.S. Cl. 229—39 R **15 Claims**



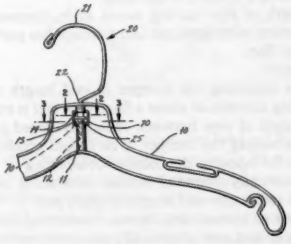
1. An ornamental package structure for packaging a product and formed of resilient semi-rigid sheet stock and including a container portion for the product and a top closure portion wherein said top closure portion comprises a plurality of top flaps joined to the container portion along substantially horizontal fold lines, wherein each of said top flaps has an ornamentation tab projecting upwardly from the outer edge of the top flap from one side of the approximate center thereof, wherein said top flaps are foldable inwardly on their associated substantially horizontal fold lines to a substantially horizontal position for closing the top of the package with a part of each top flap and the ornamentation tab projecting therefrom overlying the next adjacent top flap, wherein the projecting ornamentation tabs provide three-dimensional ornamentation for the top of the package when said top is closed, and wherein side edges of the projecting ornamentation tabs extend from substantially the center of the top of the package when closed.

4,185,768

GARMENT HANGER HAVING LATCH TO PREVENT SWIVELING

Alfred A. Treiman, 1519 Easterly Ter ., Los Angeles, Calif. 90026

Filed Oct. 2, 1978, Ser. No. 947,839
Int. Cl.[2] A47J *51/098*
U.S. Cl. 223—85 **6 Claims**



1. For use with a garment hanger of the type including a hanger body extending substantially in a plane from a central suspension portion having a vertical bore extending downward therein, and having a window opening through said suspension portion into which said vertical bore extends, said window

opening having side walls, and further of the type including a hook member having an upper hook portion in a vertical plane, a lower shaft portion secured rotatingly in the central suspension vertical bore of said hanger body, and detent means of non-circular cross-section provided in said hook member shaft portion at the level of said window opening, the detent means being of substantially less vertical height than the height of the window opening.

a latch member for converting such garment hanger from a swiveling display hanger to a fixed-hook storage hanger, said latch member being of a vertical height which does not exceed the difference in height between that of such hanger body window opening and that of such detent means, and having a substantially constant horizontal cross-section throughout its vertical height, and comprising

a pair of opposed outer surfaces matable within the side walls of such hanger body window opening, and

means, non-circular in cross-section and spaced substantially midway between said opposed outer surfaces, to accommodate said hook member shaft portion adjacent to its non-circular detent means and upon vertical sliding of the latch member to engage the detent means of such hook member when its upper hook portion is in the plane of the hanger body,

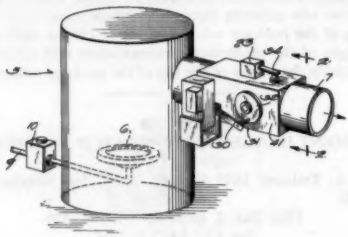
whereby the interengagement by the latch member of such detent means and such hanger window opening side walls prevents such hook member from swiveling relative to such hanger body.

4,185,769

EXHAUST FLUE DAMPER AND CONTROL SYSTEM THEREFOR

James E. Nezworski, 1310 Sunnycrest Dr., Waukesha, Wis. 53186

Filed Sep. 12, 1977, Ser. No. 832,539
Int. Cl.[2] G05D *23/12*
U.S. Cl. 236—1 G **2 Claims**



1. A damper assembly for installation in the exhaust flue of a furnace having a burner, comprising:

A. a length of pipe having means at its opposite ends for connection with upstream and downstream portions of the exhaust flue;

B. a damper;

C. means mounting the damper in said length of pipe for swinging movement about a fixed axis that is transverse to said length of pipe between open and closed positions;

D. means biasing the damper to its closed position;

E. means for opening the damper comprising

(1) electrically powered motion producing means fixed with respect to said length of pipe, and

(2) motion transmitting means connected between the damper and said electrically powered motion producing means; and

F. means for initiating operation of the burner of the furnace as a consequence of movement of the damper to its open position comprising

(1) an electric switch fixed with respect to said length of pipe and having an actuator by which the switch is tripped, overlying a hole in said length of pipe, said hole being in line with a peripheral area of the damper that is remote from the axis about which it swings;

(2) a tubular guideway fixed in said hole, and

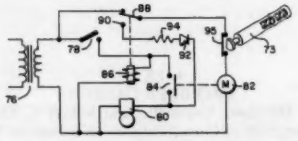
(3) a motion transmitting plunger slidable in said tubular guideway with one end thereof positioned to have said peripheral area of the damper collide therewith as the damper moves to its open position and its other end engageable with the actuator of the switch to trip the same as the damper reaches its open position.

4,185,770

AUTOMATIC FLUE DAMPER CONTROL SYSTEM

George W. Nagel, Forest Hills Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 27, 1978, Ser. No. 900,680
Int. Cl.[2] F23L *11/00*
U.S. Cl. 236—1 G **8 Claims**



5. A control system for a furnace flue damper assembly of the type in which an AC damper motor energized from an AC line holds the damper in a closed position while the furnace is off, and biasing means drives the motor in a deenergized condition in a direction to move the damper to an open position when the furnace is to come on in response to a thermostatic demand for heat, comprising:

a thermostatic switch for controlling furnace operation;

electrically energized flow means;

relay means including actuating means and controlled switch means, said controlled switch means having first and second positions corresponding to said relay actuating means being energized and deenergized, respectively;

a damper position responsive switch operable from open to closed when said damper has moved in an opening direction to closely approach a full open position;

a thermostatic switch controlled circuit connected across said line including said thermostatic switch in series with one branch circuit including said electrically energized fuel flow means and said damper position responsive switch in series, and in series with another branch circuit including said relay actuating means in parallel with said one branch circuit;

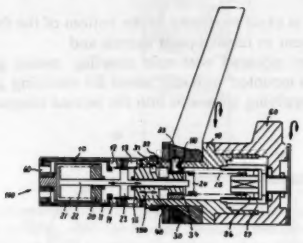
a first, full AC, motor energization control circuit connected in parallel with said thermostatic switch controlled circuit and across the line, said first circuit including said relay controlled switch means in said second position and said motor in series for energizing said motor at full AC; and

a second, braking circuit including in series a rectifier, said relay controlled switch means in said first position and said motor, said second, braking circuit being connected across AC concurrently with closure of said damper position responsive switch to effect a DC supply to said motor to dynamically brake said motor at said close approach of said damper to a full open position.

4,185,771
WATER MIXING VALVE WITH TEMPERATURE REGULATION, TEMPERATURE SETTING AND VOLUME CONTROL

Rudolf Killias, Gossau, Switzerland, assignor to Albert Lins, Küsnacht, Switzerland

Continuation-in-part of Ser. No. 794,032, May 5, 1977, abandoned. This application Nov. 9, 1977, Ser. No. 849,937
Claims priority, application Switzerland, Feb. 18, 1977, 2068/77; Aug. 31, 1977, 10617/77
Int. Cl.² G05D 23/00
U.S. Cl. 236—12 R **6 Claims**



1. A mixing valve device for hot and cold water having an automatic temperature control for the outflowing water that comprises a temperature sensor including a control bellows disposed in a mixing chamber contained within a casing and valve means controlled by said temperature sensor for controlling the inflow of cold and of hot water to said mixing chamber, and in which said casing at one of its ends has both a manual temperature setting control for the automatic temperature control and a manual flow quantity setting means for controlling the aggregate flow through said valve means, said mixing valve having the improvement wherein, in combination:

said valve means comprise a sleeve shaped valve closure body (23) mounted on a control rod (22) affixed to and movable by said control bellows (21), and also valve seats (14, 15) having sealed surfaces opposite the ends of said sleeve shaped valve closure body (23);

said flow quantity manual control (30) is connected with axial shift-producing means (150, 31–34) for changing the relative spacing between the respective valve seats (14 and 15) disposed at opposite ends of said valve closure body and

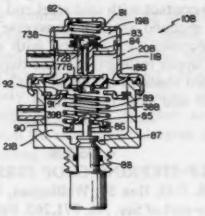
said casing (10), at its end opposite that at which the manual flow-quantity control and temperature setting means (30 and 50) are provided, is formed as a mandrel (100) for interchangeably installing the device in a plumbing fixture casing and said mandrel is provided with peripheral openings (12,13), respectively, for cold and hot water, axially displaced from each other, and an outlet opening (60) at its tip for the mixed water.

4,185,772
CONDITION RESPONSE DIFFERENTIAL VACUUM REGULATOR AND METHOD OF MAKING THE SAME

Harold G. Brakebill, Concord, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 771,163, Feb. 23, 1977, Pat. No. 4,108,197. This application May 11, 1978, Ser. No. 905,060
Int. Cl.² G05D 23/02
U.S. Cl. 236—86 **4 Claims**

1. In a differential vacuum regulator having an input chamber and an output chamber and control means for providing an output signal in said output chamber that has a constant differential value from the value of an input signal in said input chamber, said regulator having condition responsive means independent from the value of said input signal for varying said differential value in relation to the condition being sensed by said condition responsive means, said regulator having a spring that has an effective force that provides said constant differential value, said condition responsive means being operatively associated with said spring to vary said effective force thereof in response to variations in the condition being sensed thereby to thereby vary said differential value, said condition responsive means having a movable member that is moved relative to said regulator upon changes in said sensed conditions, said movable member being operatively interconnected to said

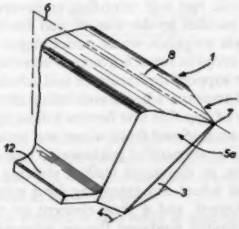


spring, said regulator having vent means interconnected to said outlet chamber, said spring force tending to open said vent means, the improvement wherein said regulator has a movable flexible diaphragm means separating said chamber and being disposed intermediate and in operative engagement with said spring and said vent means, said diaphragm means having restriction means interconnecting said chambers together at a controlled rate, said condition responsive means being responsive to temperature.

4,185,773
METHOD OF MANUFACTURING 12 TO 14% MN STEEL COMPONENTS WITH WELDABLE END PIECES

Pierre Blanc, Barfleur, and Robert Perrot, Hardelot-Plage, both of France, assignors to Societe des Acieries de Paris et D'Outreau, Paris, France

Filed Oct. 29, 1976, Ser. No. 736,699
Claims priority, application France, Oct. 31, 1975, 75 33434; Dec. 31, 1975, 75 40243
Int. Cl.² B22D 19/00
U.S. Cl. 238—150 **5 Claims**



1. Method of providing at least one end of an austenitic manganese steel track component containing 12 to 14 percent by weight of manganese with a corresponding steel end piece of mainly an austenitic structure and having a foot and a head, said manganese steel track component having an upper surface forming a rolling tread and presenting at said one end a front end surface, comprising the steps of:

providing said front end surface with an inclination about a transverse horizontal axis,

forming at said front end surface two opposite lateral end surfaces inclined towards a vertical median plane of said one end, whereby giving to the front end surface a trape-

zoidal configuration with a minor base coincident with said upper rolling tread, and

casting said corresponding steel end piece in a mould disposed directly at said one end of said manganese steel track component.

5. An austenitic steel track comprising an austenitic manganese steel component containing 12 to 14 percent be weight of manganese provided at least one end with a corresponding steel end piece having mainly an austenitic structure, said austenitic manganese steel component having an upper surface forming a rolling tread and presenting at said one end a front end surface in contact with said steel end piece, said front end surface being inclined about a transverse horizontal axis and having a tropezoidal configuration with a minor base coincident with said upper rolling tread, and two opposite lateral end surfaces inclined towards a median plane of said one end, one on each side of said front end surface.

4,185,774

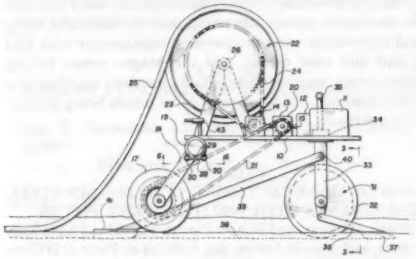
SELF-STEERING CROP IRRIGATOR

Hubert Tidwell, P.O. Box 57, Wellington, Utah 84542

Continuation-in-part of Ser. No. 771,262, Feb. 23, 1977, Pat. No. 4,119,272. This application Jul. 31, 1978, Ser. No. 929,550

Int. Cl.[2] B05B *3/18*

U.S. Cl. 239—184 **7 Claims**



1. A crop irrigator comprising a support, power drive means on the support, a pair of widely spaced support and traction wheels for the support secured thereto and operatively connected with the power drive means, a hose reel on the support and operatively connected with the power drive means, an irrigation boom on the support having a connection with the hose of the hose reel and extending transversely thereof and substantially parallel to the axis of said traction wheels and having multiple irrigation water outlet means along its length for irrigating crops in rows, a front self-steering and stabilizing wheel for the support forwardly of and substantially midway between said traction wheels and being channeled to form thereon a pair of opposite side furrow following rims, a furrow former in advance of said front wheel and secured thereto and adapted to form two parallel guidance furrows for said furrow following rims, an elongated trailing steering arm connected with said front wheel and extending for a substantial distance rearwardly thereof, and a shoe element on the rear of said steering arm having guidance flanges adapted to ride in said parallel furrows.

4,185,775

PORTABLE AIRLESS SPRAYING DEVICE

Delta R. Hester, 9743 Lucore, Houston, Tex. 77017

Filed Aug. 22, 1977, Ser. No. 826,476

Int. Cl.[2] B05B *7/24*

U.S. Cl. 239—308 **3 Claims**

1. A portable spraying device using an airless spray gun for spraying paint and a hose mounted with said spray gun for carrying paint to said gun, comprising:

a single vessel movable to relatively inaccessible locations for spraying, said vessel being constructed to withstand a gas pressure of approximately 300 psi and having a dividing wall to provide a first compartment for holding approximately 3½ gallons of paint and a second compartment for holding pressurized gas which defines a volume capable of holding approximately 50 percent more than the first compartment;

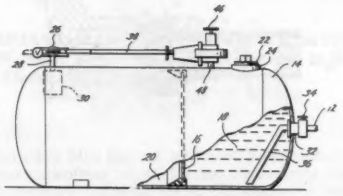
paint inlet means mounted with said vessel for receiving paint into the first comparment;

coupling means mounted with the first compartment for mounting the hose to said vessel;

a pick-up tube mounted within the first compartment of said vessel for carrying paint to said coupling means, said tube having

an inlet in close proximity to the bottom of the first compartment to receive paint therein and

an outlet mounted with said coupling means; gas inlet means mounted with said vessel for receiving gas from gas supplying apparatus into the second compartment;



a gas dryer mounted with said gas inlet means for removing moisture from the gas to inhibit potential contamination of the paint;

conduit means mounted with said vessel and leading from the second compartment to the first compartment for carrying the pressurized gas from the second compartment to the first compartment to push the paint through the pick-up tube and hose to said airless spray gun;

first and second pressure gauges mounted with said conduit means for indicating the amount of gas pressure in the first and second compartments independently of one another; and

first and second shutoff valves mounted with said conduit means for stopping the flow of pressurized gas out of the first and second compartments to permit disconnection of said conduit means from both compartments when repairs are to be made.

4,185,776

MANUALLY OPERATIVE ATOMIZER

Takamitsu Nozawa, Tokyo, Japan, assignor to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Division of Ser. No. 782,888, Mar. 30, 1977, Pat. No. 4,132,359. This application Oct. 10, 1978, Ser. No. 949,757

Claims priority, application Japan, Apr. 9, 1976, 51/44649; Apr. 9, 1976, 51/44650; Apr. 13, 1976, 51/45761; May 31, 1976, 51/70146

Int. Cl.[2] B05B *9/04*

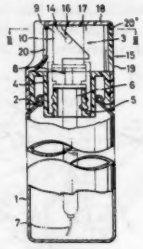
U.S. Cl. 239—333 **2 Claims**

1. In a manually operable atomizer of the type having a container for containing liquid and an atomizer assembly connected to said container for atomizing the liquid, the atomizer assembly including a cylinder, a piston slidable in said cylinder, an atomizer head having a nozzle port therein, a pipe connecting and allowing communication between said piston and said atomizer head, and a spring biasing said atomizer head in a first direction, movement of said atomizer head in a direction opposite said first direction causing compression of liquid in said cylinder, forcing the liquid through said pipe and out through said nozzle port,

the improvement comprising:

a pair of guide pins projecting outwardly from respective side surfaces of said atomizer head;

an operating member for depressing said atomizer head against the biasing of said spring, said operating member including two spaced sideplates located on respective sides of said atomizer head, each of said side plates including an inclined cam surface for engaging a respective one of said guide pins; and



a cap connected to said container for supporting said operating member, said cap having openings therein for allowing access to said operating member and to allow passage of the atomized liquid, said operating member being slidably mounted in said cap for movement in a direction substantially perpendicular to said first direction, said cap including two spaced guide plates slidably engaging respective ones of said side plates.

4,185,777

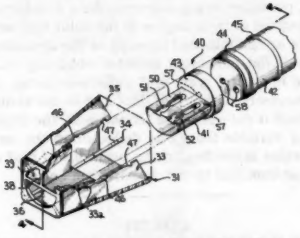
FLUIDIC SPRAY DEVICE OF SIMPLE CONSTRUCTION

Peter Bauer, Germantown, Md., assignor to Bowles Fluidics Corporation, Silver Spring, Md.

Continuation of Ser. No. 792,452, Apr. 29, 1977, abandoned, which is a continuation-in-part of Ser. No. 691,084, May 28, 1976, abandoned. This application Apr. 27, 1978, Ser. No. 900,475

Int. Cl.[2] B05B *1/02*

U.S. Cl. 239—394 **27 Claims**



1. A liquid spray apparatus comprising:

a substantially rigid body member having a first surface and being fabricated of solid material which is slightly deformable when subjected to compression forces exerted substantially normal to said first surface, at least part of said first surface having a predetermined contour;

a substantially rigid sealing member disposed immediately adjacent said body member, said sealing member having a sealing surface which abuts said first surface and is contoured to match said predetermined contour;

a fluidic element in the form of recessed flow passages defined as a cutaway portion of said predetermined contour in said first surface and sealed by said sealing surface, said fluidic element including: a nozzle configured to receive liquid under pressure and issue a jet of said liquid; means responsive to issuance of said jet for sweeping said jet in the plane of said element; wherein said nozzle is located remote from all edges of said first surface; an outlet for issuing said swept jet exteriorly of said body and sealing members;

an inlet passage adapted to receive liquid under pressure and conduct same to said nozzle, said inlet passage having a downstream end which communicates with said nozzle from a location out-of-plane with respect to said fluidic oscillator and out of communication with the edges of said first surface; and

wherein said body member and sealing member are tightly press-fitted together, one inside the other, to force said body member and said sealing member together, normal to said first surface, under sufficient pressure to tightly engage said body member and sealing member while slightly deforming said body member and effecting a positive liquid seal for said fluidic element along the abutting first and sealing surfaces.

4,185,778

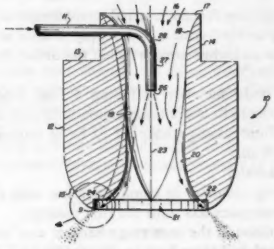
SPRAY NOZZLE

Romuald J. Drlik, Phoenix, Ariz., assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Mar. 30, 1978, Ser. No. 891,615

Int. Cl.[2] B05B *1/34*

U.S. Cl. 239—405 **6 Claims**



1. In a spray nozzle for converting a stream of liquid into a mist or fine droplets:

(a) a body having a venturi passage extending from end to end therein and which passage comprises a flare-shaped portion at one end, an intermediate waist, and a bell-shaped portion at the other end;

(b) a hydro-step formed in said body at said bell-shaped end with said flared end portion being adapted to receive a stream of liquid, said hydro-step having a flat annular surface normal to the axis of the venturi passage and a cylindrical surface parallel to the axis of the venturi passage and meeting said flat annular surface at the periphery thereof;

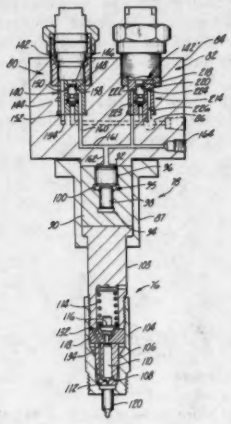
(c) said venturi passage being cloverleaf in cross-section normal to its axis and having a plurality of lateral helical recesses opening thereinto; and

(d) a conduit for delivering air under pressure to said venturi passage and which conduit has a discharge end in close proximity to the waist of the venturi and a portion immediately adjacent to said discharge end and coaxial with said venturi passage.

4,185,779
FUEL INJECTOR

Edwin B. Watson, Sidney, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jan. 16, 1978, Ser. No. 869,875
Int. Cl.[2] F02M 51/00
U.S. Cl. 239—533.3 15 Claims



1. A fuel injector for an internal combustion engine, the engine being provided with a fuel supply source and a drain with the source at higher pressure than the drain, the injector comprising:

an injector body member including a first fluid passage adapted to be in fluid communication with said source and a second fluid passage adapted to be in communication with said drain,

an injector nozzle,

a fuel metering chamber in communication with the nozzle and in communication with the first passage,

an injector piston in the metering chamber and being movable to expel fuel therefrom to the nozzle,

an actuator chamber,

an actuator piston in the actuator chamber and being movable in response to fluid pressure in the actuator chamber,

said injector piston being connected with the actuator piston and movable therewith,

a timing valve having an inlet adapted to be in communication with a source of actuator fluid under pressure and having an outlet in communication with said actuator chamber,

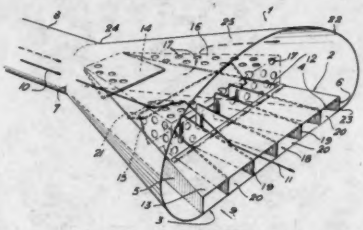
a metering valve having an inlet in communication with said actuator chamber and an outlet adapted to be in communication with an actuator fluid drain,

and control means for said timing and metering valves for independent actuation thereof whereby opening said metering valve for a pedetermined time period while the timing valve is closed causes the injector piston to move outwardly of the metering chamber to provide a predetermined volume of fuel in the metering chamber and opening of the timing valve while the metering valve is closed causes the actuator piston to actuate the injector piston and expel fuel from the metering chamber to the nozzle.

4,185,780
POWDER-DISTRIBUTING DEVICE

Alain Duchêne, Pierrevert; Jean-Claude Malet, Aix-en-Provence, and Francis Neu, Villeneuve d'Ascq, all of France, assignors to Commissariate a l'Energie Atomique and S.A. des Establissements NEU, both of, France

Filed Oct. 27, 1977, Ser. No. 845,859
Claims priority, application France, Oct. 29, 1976, 76 33658
Int. Cl.[2] B05B 1/14
U.S. Cl. 239—553.5 6 Claims



1. A powder-distributing device comprising a hollow duct open at both ends and mounted at the end of a pipe for the flow of a powder in suspension in a carrier gas, wherein said duct is constituted by a pyramid frustum formed by four lateral walls, by an open base which is located upstream with respect to the direction of flow of the powder and connected to the pipe and by an open base located downstream, the transverse cross-section of the pyramid frustum aforesaid being of increasing width from the upstream end to the downstream end and of decreasing height also from the upstream end to the downstream end, a first end wall of said pyramid frustum being solid and a second opposite wall thereof being provided with an opening cut-out in said second wall between the upstream base which is connected to the pipe and a solid portion connected to the downstream base in order to define a nozzle at the end of the duct through which said powder is sprayed, the device aforesaid being further provided with a perforated screen joined to the opening of the second wall and provided over the entire surface thereof with holes through which the carrier gas is discharged, provision being also made for a grid formed by flat partitions located at right angles to the solid wall and extending from the nozzle into said opening at the upstream end and for a series of flat deflectors oriented obliquely and inclined towards the first solid wall, said deflectors being adapted to extend transversely within said duct and in the vicinity of the opening which is cut-out in the second wall, the angle of inclination being variable from one deflector to the next and of increasing value according to the positions of said deflectors from the upstream end to the downstream end.

4,185,781
QUICK-DISCONNECT NOZZLE CONNECTION

Edward J. O'Brien, Barrington, Ill., assignor to Spraying Systems Co., Wheaton, Ill.

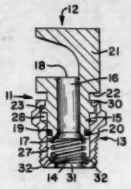
Filed Jan. 16, 1978, Ser. No. 869,421
Int. Cl.[2] B05B 1/02
U.S. Cl. 239—600 1 Claim

1. A quick disconnect nozzle comprising a spraying tip having a cylindrical inlet stem at one end of said tip, an enlarged spray head formed on the other end of said tip including a deflector portion adapted to deflect spray in a direction substantially perpendicular to the axis defined by said cylindrical stem, said spray head of generally larger diametric dimension than said stem including a bottom surface defining stop means for said spraying tip when said stem is inserted into a nozzle body and an interior fluid passage communicating from one end of said stem through said tip to said spray head;

locking means disposed on said stem comprising a pair of

arcuate sections extending radially outwardly from the surface of said stem and a recess formed in each arcuate section;

a nozzle body adapted to be connected to a source of fluid including an interior fluid passage defined therein, a first chamber adapted to receive said stem of said spraying tip, a second chamber adapted to receive the arcuate sections of said locking means for rotation therein, and a pair of opposed retention means extending radially inwardly along a diameter of said second chamber adapted to engage corresponding recesses in said arcuate sections of said locking means, said arcuate sections insertable past



said opposite retention means into said second chamber when oriented in one position and fully rotatable in said second chamber when said stem is fully inserted into said first chamber to a position at which said recesses in each of said arcuate sections matingly engage one of said pair of retention means upon release of said spraying tip;

resilient biasing means disposed between said spraying tip and said nozzle body to urge said tip and body away from each other for retaining said tip and said body in a locked and precise angular relationship; and,

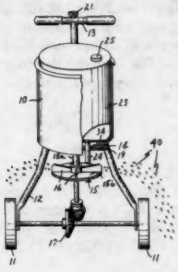
sealing means disposed between the cylindrical stem of said spraying tip and said first chamber of said nozzle body to prevent fluid leakage between said tip and body.

4,185,782

BROADCAST SPRAYER

Frank R. Belrose, Box 456, Rte. 1, Shakopee, Minn. 55379

Filed Nov. 17, 1977, Ser. No. 852,517
Int. Cl.[2] B05B *17/00*; A01C *23/00*
U.S. Cl. 239—663 **23 Claims**



2. A ground traversing fluent material applicator comprising reservoir means capable of holding fluent solid and liquid material,

distributing means for applying said fluent material to the ground being traversed, and

means for directing said fluent material from said reservoir means to said distributing means and,

wherein said reservoir means includes a hopper,

a liquid tight container within said hopper, and

conduit means for conveying liquid from said container to said distributing means, and

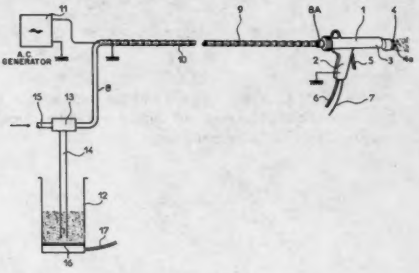
wherein said container is of flexible collapsible wall construction.

4,185,783

POWDER FEED DEVICE FOR POWDER DISPENSING APPARATUS

Adrien Lacchia, Meylan, France, assignor to Air Industrie, Courbevoie, France

Filed Jun. 12, 1978, Ser. No. 914,867
Claims priority, application France, Jun. 14, 1977, 77 19043
Int. Cl.[2] B05B *5/02*
U.S. Cl. 239—704 **8 Claims**



1. A powder feed device adapted to convey fluidized powder between a powder fluidization tank and an inlet of an electrostatic powder dispensing apparatus having an electrostatic spray head and electrode charging means, said powder feed device comprising a powder feed tube formed of electrically insulating material, means for subjecting the powder flowing through said tube to an alternating field for insuring homogenous flow of fluidized powder through the tube and comprising, an outer conductor extending around said tube along the major part thereof, an inner conductor extending through said tube or hose substantially in the direction of flow of fluidized powder to be dispensed, and means for connecting said inner and outer conductors across a high voltage A.C. source, so as to prevent the formation of and/or to break up clumps or concentrations of fluidized powder in said feed tube or hose.

4,185,784

HEAT TREATMENT APPARATUS FOR WASTE CONTAINING THERMOPLASTIC MATERIAL

Eberhard Flita, Beethovenstrasse 9,, 6521 Monsheim, Fed. Rep. of Germany

Filed Jul. 3, 1978, Ser. No. 921,596
Int. Cl.[2] B02C *23/00*
U.S. Cl. 241—66 **7 Claims**

1. Apparatus for treatment of industrial and domestic refuse, said apparatus comprising:

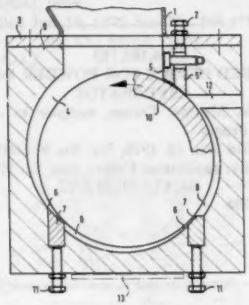
a. a machine body having an opening of predetermined geometry for receiving a roll;

b. a generally cylindrical roll mounted in said body opening, with means for rotating said roll, said roll and said opening geometry defining a plurality of adjacent converging gaps therebetween;

c. said body containing a charging inlet for introducing said refuse, said charging inlet being positioned at the start of a first of said converging gaps, and further containing a discharge outlet at about the end of another of said gaps, for discharging treated refuse;

d. scraper means positioned in operative registration with said discharge outlet for scraping treated refuse from said roll; and

e. a crusher block mounted at the end of each of a plurality of said gaps, said geometry being a continuous curve for



the length of each of said gaps and discontinuous at the point where each crusher block defines the end of one gap and the start of an adjacent gap.

4,185,785

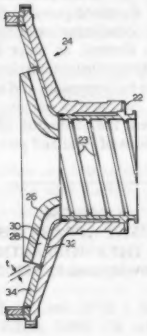
GRINDING MILL DIAPHRAGM DISCHARGE SYSTEM

John E. Nelson, Montreal, Canada, assignor to Dominion Engineering Works Limited, Lachine, Canada

Continuation of Ser. No. 802,353, Jun. 2, 1977, abandoned. This application Jul. 24, 1978, Ser. No. 927,027

Int. Cl.[2] B02C *17/22*

U.S. Cl. 241—70 **3 Claims**



1. A rotary grinding mill having a drum, opposed end heads on said drum, one head having a central pulp discharge orifice,

a diaphragm spaced axially from said one head to provide a pulp containment end zone open at its radially outer edge for the ingress of pulp from the drum, the diaphragm having a plurality of lifter ribs dividing the end zone into a plurality of adjacent zone segments, the radially outer portion of the pulp containment zone defining a pulp classifier wherein pulp is differentially separated in accordance with the relative fineness thereof,

the radially outer edge of the diaphragm overhanging the opening to said pulp zone, to deflect larger particles away from the pulp zone, said lifter ribs extending into the pulp containment zone to provide selective transfer of pulp therefrom.

4,185,786

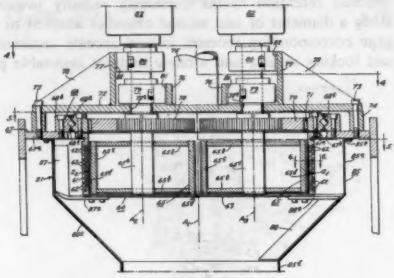
ROTARY EXTRUSION APPARATUS

Donald C. Kline, Allentown, Pa., assignor to Lehampton Farms, Inc., Macungie, Pa.

Division of Ser. No. 713,349, Aug. 11, 1976, Pat. No. 4,109,448. This application Aug. 15, 1978, Ser. No. 933,854

Int. Cl.[2] B02C *15/00*

U.S. Cl. 241—85 **13 Claims**



1. Rotary extrusion apparatus, comprising:

frame means including a plate having a circular aperture,

a die ring carried in said frame means interiorily of said aperture,

said die ring having a cylindrical wall with extrusion orifices therein,

means for feeding extrudable material into said die ring including distributor means carried by said frame means for depositing said material in said die ring,

bearing means surrounding said cylindrical wall adjacent one end of said die ring to mount said die ring for rotation in said frame means, said bearing means having inner and outer rings with the outer ring being mounted to said plate around said aperture and the inner ring being mounted to said die ring wall so that said die ring depends below said frame plate,

roller means disposed inside said die ring for rotation in close proximity with the inside of said die ring wall, said roller means including a pair of rollers disposed at diametrical locations in said die ring, each roller having a diameter slightly less than the inside radius of said die ring wall to provide an elongated nip between each roller and the die ring to improve feeding of the material between the rollers and the die ring,

means for rotating said roller means, and

means coupling said roller means to said die ring to cause said roller means to rotate with said die ring,

whereby material fed into the die ring is extruded through the extrusion orifices upon rotation of the die ring and roller means.

4,185,787

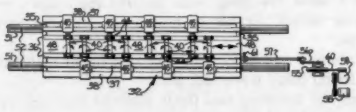
APPARATUS FOR MAKING WOOD SHAVINGS

Richard F. Plyler, Pageland, S.C., assignor to Dennis Michael Plyler, Pageland, S.C., a part interest

Filed Jul. 31, 1978, Ser. No. 929,547

Int. Cl.[2] B02C *1/00, 18/26*

U.S. Cl. 241—101.5 **18 Claims**



1. An apparatus for producing wood shavings comprising:

an elongate open-bottomed stationary hopper adapted for

receiving a supply of elongate wood pieces for being formed into wood shavings,

an elongate carriage positioned lengthwise beneath said elongate hopper and closely adjacent the open bottom thereof,

a series of transversely extending cutters carried by said carriage at spaced locations along the length thereof, said cutters being adapted for engaging the wood pieces in the lowermost portion of said hopper at spaced locations along the length of the pieces and for forming wood shavings from the wood pieces,

means mounting said carriage for movement along a predetermined path of travel lengthwise of said elongate hopper, and

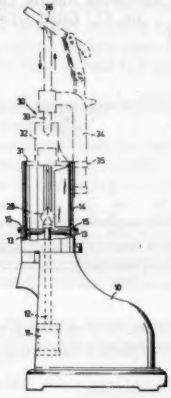
means for moving said carriage along said path of travel in a reciprocating manner over a predetermined relatively short stroke of movement substantially less than the length of said hopper, and wherein the cutters of said series are so located as to permit said short stroke of movement of said carriage and such that the cutters of said series collectively engage and form shavings from the elongate wood pieces over the entire length of the wood pieces.

4,185,788

APPARATUS FOR DISINTEGRATING FOODSTUFFS, ESPECIALLY FRUIT AND VEGETABLE FOODSTUFFS

Bengt Durling, Solna, Sweden, assignor to AB Halldemaskiner, Solna, Sweden

Filed Sep. 21, 1978, Ser. No. 944,547
Claims priority, application Sweden, Sep. 27, 1977, 7710782
Int. Cl.² B02C *18/06*
U.S. Cl. 241—285 A **9 Claims**



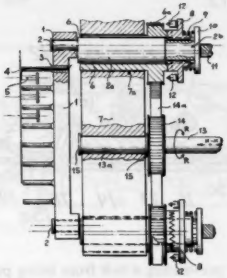
1. Apparatus for disintegrating foodstuffs, especially fruit and vegetable foodstuffs, including a casing, a spindle supported rotatably in said casing and extending axially therethrough and driven by a motor, a disintegrating member, e.g. in form of a cutting disc connected with said spindle, a feeding hopper mounted concentrically on said casing and above said disintegrating member, a pressing member for feeding foodstuffs in direction towards said disintegrating member, the inner walls of said hopper being provided with radially directed members forming a number of sectors, the improvement being seen therein that said hopper is provided with a number of slits, for receiving a number of vertically located walls, said walls being detachably and/or fixedly arranged, and extending radially to near the centerline of the hopper thereby forming open sections.

4,185,789

STRUCTURE OF A MULTIPLE WIREGUIDE

Giuseppe Camardella, Saronno, Italy, assignor to Tekma Kinomat S.p.A., Caronno Pertusella, Italy

Filed Nov. 17, 1977, Ser. No. 852,526
Claims priority, application Italy, Nov. 4, 1976, 29697 A/76
Int. Cl.² H01F *41/06*
U.S. Cl. 242—7.11 **6 Claims**



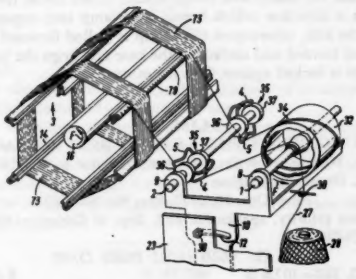
1. In a coil winding machine, a multiple wire guide comprising a support, a plurality of wire guides of said support, two parallel pins rotatably connected to said support for driving said support in a circular path, means for moving said pins in circular paths of the same diameter about two spaced parallel axes, and means to adjust the eccentricity of said pins relative to said axes thereby selectively to change the diameter of said circular path followed by said support.

4,185,790

REELING MACHINE FOR FORMING A HANK

Dominique M. Delerue, 43, Rue de la Briqueterie, F. 59420 Mouvaux, France

Filed Feb. 13, 1978, Ser. No. 877,333
Claims priority, application France, Feb. 18, 1877, 77 04708
Int. Cl.² B65H *54/56*
U.S. Cl. 242—53 **12 Claims**



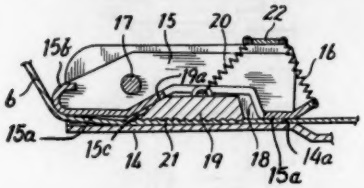
1. A reeling machine for forming cylindrical or conical hanks from spools of yarn, said machine comprising a rotatable reel; traverse means for distributing yarn axially of the reel; and a lifting guide means to engage and lift the yarn from its normal path of movement as the yarn approaches an end of a traverse stroke to increase the yarn path from said traverse means to said reel so as to adjust the traverse of the yarn across said reel whereby a hank is formed with varying length yarn layers.

4,185,791

DEVICE FOR PREVENTING A BELT FROM BEING PULLED FROM A RETRACTOR

Juichiro Takada, Tokyo, Japan, assignor to Takata Kojyo Co., Ltd., Tokyo, Japan

Filed Oct. 10, 1978, Ser. No. 950,019
Claims priority, application Japan, Oct. 24, 1977, 52-141914[U]
Int. Cl.[2] A62B 35/00; B65H 75/48
U.S. Cl. 242—107.2 1 Claim



1. A device for preventing a belt from being pulled from an emergency locking retractor or the like comprising a clamp holder and a base member having closely spaced surfaces defining a narrow gap through which the belt passes and from which the belt runs off forwardly at an angle generally away from the base member around a forward nose portion of the clamp holder, a clamp received by the clamp holder and having a belt-gripping surface which is generally continuous to but protrudes from said surface of the clamp holder and defines part of the belt-receiving gap, generally matching wedge surfaces on the clamp holder and clamp oriented forwardly obliquely and transversely to the belt-receiving gap and adapted selectively to wedge the clamp into engagement with the belt upon abrupt movement of the belt forwardly through the gap, means mounting the clamp holder for pivotal movement about an axis transverse to the direction of movement of the belt, spaced from the gap and intermediate of the forward end of said gap and the rearward end of the gripping surface of the clamp, and means resiliently urging the clamp and clamp holder about the pivot axis in a direction tending to move the nose portion of the clamp holder toward said surface of the base member and to hold the clamp away from the belt, the resilient means yielding to a force exerted on the nose portion of the clamp holder upon an abrupt forward pull of the belt such that the clamp and clamp holder rotate about the pivot axis in a direction which brings the clamp into engagement with the belt, whereupon the clamp is pulled forward and is wedged toward said surface of the base and grips the belt and the belt is locked against forward movement.

4,185,792

LOCKING DEVICE FOR A SAFETY BELT RETRACTOR

Per O. Weman, Heverlee, Belgium, assignor to N.V. Klippan S.A., Haasrode, Belgium

Filed Oct. 26, 1977, Ser. No. 845,710
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1976, 2648902
Int. Cl.[2] A62B 35/02; B65H 75/48
U.S. Cl. 242—107.4 B 8 Claims

1. Locking device for a safety belt retractor, comprising:

a. a reel shaft;

b. ratchet wheel means provided with locking teeth and secured to said reel shaft;

c. pawl means engageable with said locking teeth to lock said ratchet wheel means and the reel shaft against rotation;

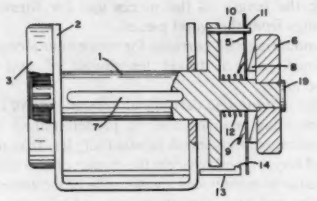
d. inertial means mounted on said reel shaft for rotation relative thereto upon a predetermined acceleration thereof;

e. a synchronization disk having a very small mass inertial moment relative to the inertial means and being mounted on said reel shaft for axial movement on said reel shaft;

f. said disk having projections on the periphery thereof to engage said pawl means;

g. first disengagement means mounted on said disk;

h. second disengagement means mounted on said reel shaft for rotational movement relative to said first disengagement means;



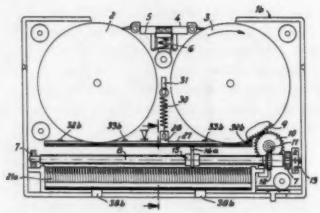
i. said rotation of said inertial means relative to said shaft upon acceleration thereof causing the second disengagement means to rotate relative to said first disengagement means causing said disk to move axially into actuating engagement with said pawl means to move said pawl means into engagement with said locking teeth.

4,185,793

CASSETTE USING TAPE-MARKING ELEMENTS

Viktor Stuzzi, Vienna, Austria, assignor to Firma Stuzzi Radiotechnische Fabrik Spezialunternehmen fur Magnettontechnik, Vienna, Austria

Filed Oct. 2, 1978, Ser. No. 947,741
Claims priority, application Austria, Oct. 3, 1977, 7036/77
Int. Cl.[2] G03B 1/04
U.S. Cl. 242—199 8 Claims



1. A cassette, for use in a recording/reproducing machine having two reels suspending a tape being movable between the reels,

comprising in combination:

measuring means, including an elongated scale, for determining a length of tape taken off an initial tape position from one reel by the other,

indicating means for indicating the length of tape taken off from the initial tape position relative to said elongated scale, said indicating means being movable along said scale,

a plurality of settable marking elements having initial positions and being disposed along said scale

actuating means couplable to said indicating means for setting selected marking elements to selected positions, respectively, in the course of movement of said indicating means along said scale, thereby marking particular values of the length of tape, and

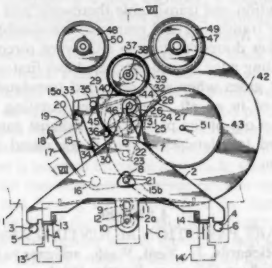
resetting means for simultaneously resetting all of said selected marking elements to their initial positions.

4,185,794

GEAR-DRIVEN CHANGE-OVER MECHANISM

Kumio Mukaida, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 14, 1978, Ser. No. 933,523
Claims priority, application Japan, Aug. 20, 1977, 52/99944
Int. Cl.[2] G11B *15/30, 15/44*
U.S. Cl. 242—201 7 Claims



1. A gear-driven change-over mechanism adapted to operate responsive to the selective depression of one of a plurality of push-button members comprising:

an operating member movable from a first position through an intermediate position to a second position upon depression of one of said push-button members,

a rotary member operatively interconnected with said operating member and rotatably mounted for rotation from a first position to a second position upon movement of said operating member from its said first position to its said second position,

a rotatably mounted transmission member rotatable between first and second positions,

spring means interconnected between said rotary member and said transmission member whereby said transmission member is rotated by said spring means when said rotary member rotates,

a first gear member operatively supported by said transmission member,

a stop member operatively associated with said operating member and movable with the movement of said operating member,

said stop member including means engageable with said transmission member to stop the rotation of said transmission member, and

a second gear member

said transmission member being rotatable between its said first position and its said second position upon movement of said operating member from its said first position to its said intermediate position wherein said stop member engages said transmission member to hold said transmission member in its said second position while said rotary member continues to rotate to its said second position against the urging of said spring means as said operating member moves from its said intermediate position to its said second position, and

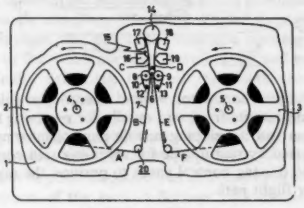
means to release said operating member from its said second position to release said stop member from engagement with said transmission member whereby said spring means urges said transmission member to rotate from its said second position to its said first position to move said first gear into rapid engagement with said second gear.

4,185,795

MAGNETIC TAPE DRIVE WITH FRICTION COMPENSATION

Anthonie Walraven, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 18, 1978, Ser. No. 934,826
Claims priority, application Netherlands, Sep. 16, 1977, 7710163
Int. Cl.[2] G11B *15/26, 15/60;* B65H *57/14*
U.S. Cl. 242—209 7 Claims



5. A tape drive arrangement comprising

means for guiding a length of tape along a path, said tape guiding means including at least one tape guide member around which the tape is passed,

a capstan for driving the tape with an accurately defined speed,

a head element disposed for operative contact with the tape, and

a control device for maintaining tension in a part of the tape along said path constant within certain limits,

wherein the means for guiding includes means for compensating variations of tension of the tape, which variations are a result of variation in the coefficients of friction between the tape and a number of components which the tape frictionally engages, said components including at least said head and said guide member, said means for compensating comprising a compensation element which frictionally engages the tape with a friction surface having an effective coefficient of friction μ_p which satisfies the relationship

$$\mu_p = \frac{\sum_{k=1}^{k=n} \mu_k \theta_k}{\theta_p}$$

in which

μ_k is the effective coefficient of friction of a component which frictionally engages the tape,

θ_k is the angle of contact in radians over which the tape frictionally engages the respective components,

θ_p is the angle of contact in radians over which the tape frictionally engages the respective member, and

n is the number of components with which the tape frictionally engages.

4,185,796

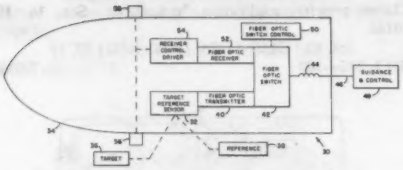
FIBER OPTIC MISSILE GUIDANCE AND CONTROL

Leon H. Riley, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 13, 1976, Ser. No. 750,034
Int. Cl. F42B *15/04;* F41G *7/02, 7/18*
U.S. Cl. 244—3.12 2 Claims

1. A fiber optic transmission system for guiding and controlling a missile in flight and to establish the missile position with respect to a target, said system comprising: target sensor means disposed in said missile for establishing the target angular

direction in relation to said missile; fiber optic means carried by said missile for transmitting said target information from said missile, said fiber optic means including a fiber optic transmitter, a fiber optic switch, a fiber optic connection between said missile and said guidance and control unit, and a bobbin having



said fiber optic conductor wound thereon; a guidance and control unit remote from said missile for receiving said target information and developing missile control information; and, means carried by said missile for receiving said control information and driving control vanes to position the missile along the proper flight path.

4,185,797

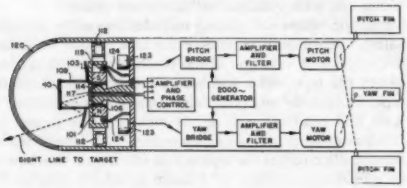
TARGET SEEKING GYRO

William B. McLean, China Lake, Calif., assignor to Walter G. Finch, Baltimore, Md.

Division of Ser. No. 583,337, May 7, 1956, Pat. No. 4,093,154, which is a continuation of Ser. No. 337,899, Feb. 19, 1953, abandoned. This application Nov. 17, 1977, Ser. No. 852,347

Int. Cl.[2] **F42B** *13/28;* **F41G** *7/10;* **G01C** *19/53, 19/28*

U.S. Cl. 244—3.16 **31 Claims**



1. In combination, a free spinning gyroscope having a spin axis, precession means for precessing said gyroscope, means for detecting an electromagnetic field of energy and adapted to generate a signal indicative of misalignment of said gyroscope spin axis with said electromagnetic field of energy, and means utlizing said signal unresolved into components for directly controlling said precession means to maintain said gyroscope spin axis aligned with said electromagnetic field of energy.

4,185,798

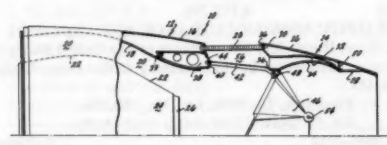
THRUST REVERSER–CASCADE TWO DOOR PRE-EXIT

Robert Dickenson, Chula Vista, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Mar. 13, 1978, Ser. No. 885,774

Int. Cl.[2] **B64C** *15/04*

U.S. Cl. 244—110 B **3 Claims**



1. A pre-exit thrust reverser for reversing the rearward flow of exhaust gases from a thrust producing jet aircraft engine, said engine being enclosed by a streamlined nacelle, said nacelle having a forward fixed section and a rearward translatable section, comprising:

at least a pair of blocker doors pivotally attached to said rearward translatable section about an axis adjacent the longitudinal centerline of said section;

a drag link member for each of said blocker doors, each of the drag link members pivotally attached at one end to said forward fixed portion and pivotally attached at their other end to the rearmost upper surface of their respective blocker door;

a cascade member fixedly attached to said rearward translatable section and translatable therewith; and

means for translating said rearward translatable section;

said blocker doors rotating in a forward direction wherein the leading edge of said blocker doors first enter into said exhaust gases when said rearward translatable section is translated in an aft direction and rotating in a reverse direction out of the path of said exhaust gases when said rearward translatable section is translated in a forward direction.

4,185,799

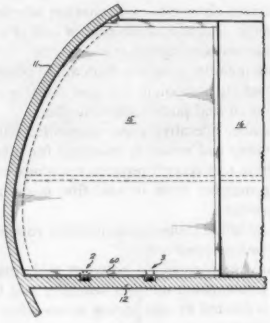
AIRCRAFT PARTITION MOUNTING ASSEMBLY

Edward W. Richards, Jr., Kent, Wash., assignor to Boeing Commercial Airplane Company, Seattle, Wash.

Filed Mar. 14, 1978, Ser. No. 886,364

Int. Cl.[2] **B64C** *1/20, 1/22, 1/28;* **B64D** *11/00*

U.S. Cl. 244—118.5 R **8 Claims**



1. An attach fitting assembly for installing a removable article in the interior of an aircraft fuselage having a seat track structurally attached to the floor of the fuselage, said attach fitting assembly comprising: said seat track defining an inverted T-slot channel member, having sequentially spaced circular cut-outs in the upper surface thereof; a foot member defining an elongated base contoured for insertion into said seat track and to be slid along in said track a distance half-way between two adjacent circular openings for vertical retention thereby; said foot member having an upright T-rail section aligned with said elongated base and structurally integral therewith, for extending above said seat track when the base of said foot member is inserted into said seat track; a retainer contoured for insertion into one of the circular openings in said seat track and having an undersurface for mating with the base of said foot member, for locking said foot member against sliding motion in said seat track; an attach angle defining a base member and an upright boss; said attach angle base member having a slot therein for slidably engaging said raised T-rail section of said foot member and being retained thereby against vertical movement; means inserted through said attach angle, said retainer and threadably engaging said foot member, for clamping these three components tightly to the seat track; a receptacle being fixedly attached to said article and adapted for engaging said upright boss for connecting said article to the floor of the aircraft fuselage.

5. Apparatus for installing a removable partition in the fuselage of an aircraft, comprising: seat tracks defining a plurality of laterally spaced and substantially parallel longitudinally, inverted T-slot channel members, having sequentially spaced circular cut-outs in the upper surface thereof, and being secured to the floor of the aircraft fuselage; said partition extending transversely in the interior of the fuselage forming a separator, and having an inverted U-shape channel defining the lower edge thereof; anchor fitting assemblies interposed between said partition lower edge portion and said seat tracks for forming a connecting means therebetween; one of said anchor fitting assemblies comprising a foot member, a retainer, an attach angle and a receptacle; said foot member defining an elongated base contoured by having sequentially spaced circular protrusions for matching insertion into said seat track and to be slid along in said track a distance half-way between two adjacent circular openings for vertical retention thereby; said foot member having an upright T-rail section aligned partially with the length of said elongated base and structurally integral therewith, for extending above said seat track when the base of said foot member is inserted into said seat track; said retainer being contoured for insertion into one of the circular openings in said seat track and having an undersurface for mating with the remaining length of the base of said foot member, for locking said foot member against sliding motion in said seat track; said attach angle defining a base member and an upright boss; said attach angle base member having a slot therein for slidably engaging said raised T-rail section of said foot member and being retained thereby against vertical movement; means inserted through said attach angle, said retainer and threadably engaging said foot member, for clamping these three components tightly to the seat track; said receptacle being contoured for mating insertion into the inverted U-shaped channel defining the lower edge of said partition and being fixedly attached thereto; and said receptacle being adapted for engaging said upright boss for restraining said article against longitudinal movement relative to the floor of the aircraft fuselage.

4,185,800

TWO-PART HOLE FASTENER

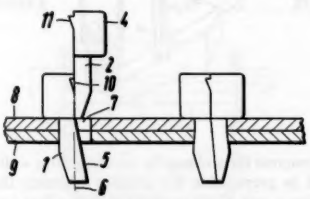
Heinrich Kabel, Quickborn, Fed. Rep. of Germany, assignor to Paul Hellermann GmbH, Fed. Rep. of Germany

Filed May 23, 1977, Ser. No. 799,202

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1976, 2624968

Int. Cl.[2] F16L *3/08*

U.S. Cl. 248—73 **9 Claims**



1. A fastener of resilient material for a panel-like structure having an opening for receiving the fastener, the fastener having a head for engaging the face of the panel-like structure and an elongated shank extending longitudinally outwardly from the head for extension through the panel-like structure opening, the fastener having first and second fastener parts with respective head portions for forming said fastener head and respective elongated shank portions, with shank sections extending longitudinally from adjacent the head portions respectively with opposed longitudinally extending substantially flat faces respectively, the shank portions forming said elongated shank and successively insertable through a panel-like structure opening to assemble the fastener parts with the shank sections extending through and beyond the opening in opposed face to face engagement for anchoring the fastener within the panel-like structure opening, the shank section of the first shank portion having a face laterally tapering toward the opposed face of the other shank section and extending longitudinally from adjacent the respective head portion and through and beyond the panel-like structure opening and a longitudinally outwardly increasing cross-sectional area provided thereby and the shank section of the second shank portion having a face extending longitudinally from adjacent the respective head portion and through and beyond the panel-like structure opening and a generally uniform prismatic cross-sectional area, the shank sections being adapted to project longitudinally through the panel-like structure opening upon said insertion of the shank portions therethrough and said opposed longitudinally extending faces of the shank sections being relatively longitudinally inclined toward each other in the unstessed condition thereof and so that both shank sections are resiliently wedged laterally from their unstressed condition, after the shank portion of the first fastener part is fully inserted through and beyond the panel-like structure opening and as the shank portion of the second fastener part is thereafter fully inserted through and beyond the opening and to place the shank sections at the opening in tension at their opposed faces and in compression at their opposite outer edges.

4,185,801

SUSPENSION ARMS

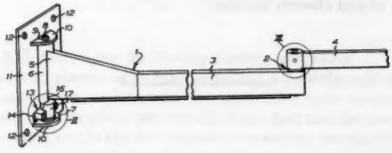
Jan L. A. Plymoth, Lycksele, Sweden, assignor to Plymoth PP AB, Lycksele, Sweden

Filed May 25, 1978, Ser. No. 909,687

Claims priority, application Sweden, Jun. 1, 1977, 7706374

Int. Cl.[2] A47G *29/00*

U.S. Cl. 248—289 R **2 Claims**



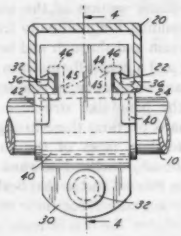
1. In a structure for supporting an object, the improvement which comprises in combination a base means: a spindle supported by said base means to define a predetermined pivot axis; an arm extending radially outward with respect to said axis; pivot connection means establishing a connection of one end of said arm to said spindle for pivotal movement relative thereto; and brake means operable to establish at said pivot connection means an adjustable braking force restricting the pivotal movement of said arm to secure same in a given position about said axis relative to the base means, said brake means including a first brake member; a second brake member, and a separate adjusting screw in direct contact with said second brake member to adjustably urge same into frictional engagement with said first brake member to establish said braking force, said first brake member being pivotable with said arm and said second brake member being movable along an adjustment path generally fixed with respect to said axis, said pivot connection means including a tube connected to said one end of said arm and receiving said spindle, and said adjusting screw being received through said tube and being pivotally movable with said tube and arm.

4,185,802

ANTI-VIBRATION PAD FOR PIPE SUPPORT CLAMP

J. Edgar Myles, Bloomfield, and Edward Fischer, Saline, both of Mich., assignors to Fischer Sherman, Inc., Redford, Mich.

Filed Sep. 13, 1978, Ser. No. 941,886
Int. Cl.[2] F16L 3/08
U.S. Cl. 248—74 A 6 Claims



1. An anti-vibration pad of deformable material for use in securing a conduit to a channel member by means of two straps enveloping said conduit and said pad wherein said channel member has inwardly turned flanges and said straps comprise two metal straps held together at one end by a nut and bolt combination and by said channel members inwardly turned flanges at the other end, wherein said pad comprises a generally tubular cylindrical body with a longitudinal slot interrupting an outer side thereof and having a flat base, the improvement comprising:

(a) four metal strap retaining flanges located one on each edge at the base of the pad which extends vertically toward said split sleeve and radially outward before extending laterally to cover a portion of the metal straps of the clamping device;

(b) two L-shaped protrusions which extend from said flat base and whose thickness extends substantially the width of the upper portion of the pad and whose horizontal leg is adapted to be engaged by means of said inward flanges of said channel member.

4,185,803

PIVOTABLE ADJUSTMENT MECHANISM

Ivar Kalvatn, Aurstad, 6110 Austefjorden, Sunnmore, Norway

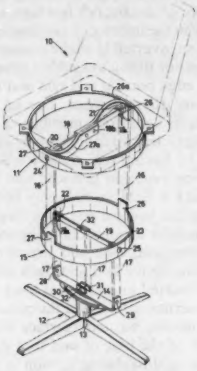
Continuation of Ser. No. 820,702, Aug. 1, 1977, abandoned. This application Jun. 26, 1978, Ser. No. 918,955
Claims priority, application Norway, Aug. 3, 1976, 762144
Int. Cl.[2] A45D 19/04; A47C 1/02
U.S. Cl. 248—608 10 Claims

1. A pivotable adjustment mechanism for a pair of mutually moveable members, said mechanism including two concentric rings suspended according to the cardan principle, said mechanism comprising: a torsion bar fastened to each said ring along a diameter thereof for adjustment of said ring, said torsion bars being arranged at right angles to each other;

the outer of said two concentric rings having a first one of said two mutually moveable members fastened thereto and being suspended by rotatably mounting the ends of its torsion bar in brackets secured to the inner ring;

said inner ring being axially displaced relative to said outer ring and suspended by rotatably mounting the ends of its torsion bar in a bracket secured to a second one of said two mutually moveable members,

said torsion bar of said outer ring being secured at its center against rotation relative to the lower ring, and said torsion bar



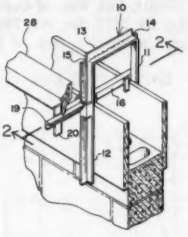
of said inner ring being secured at its center against rotation relative to said bracket secured to said second member.

4,185,804

LOCK AND RELEASE FORM CLAMP

Umberto A. Baculo, 2737 NW. 17th Ter., Miami, Fla. 33126

Filed Feb. 21, 1979, Ser. No. 13,802
Int. Cl.[2] E04G 17/12
U.S. Cl. 249—20 2 Claims



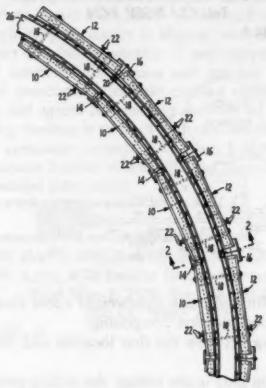
1. A concrete form clamp for securing form walls to a building wall in preparation for pouring concrete therebetween comprising a pair of leg portions having a first cross member secured at one end of said leg portions and said leg portions extending in the same direction, one of said leg portions being at substantially right angle to said cross member, the other of said leg portions extending at a substantially slightly greater than right angle to said cross bar in a direction away from said one of said leg portions, a sleeve mounted on said other of said leg portions, a second cross member secured at one end to said one of said leg portions in spaced relation to said first cross member and its other end extending through said sleeve, a lever pivotally mounted on said free end of said second cross member, engaging said one of said leg portions and pivoting the latter into substantially parallel relation with said other of said leg portions whereby said pair of said leg portions force said form walls into engagement with said building wall.

4,185,805

APPARATUS AND METHOD FOR CONSTRUCTING ADJUSTABLE CURVILINEAR CONCRETE FORMS

Josh Ewing, San Antonio, Tex., assignor to The Burke Company, San Mateo, Calif.

Filed Jun. 16, 1978, Ser. No. 916,104
Int. Cl.[2] E04G 17/00
U.S. Cl. 249—210 **11 Claims**



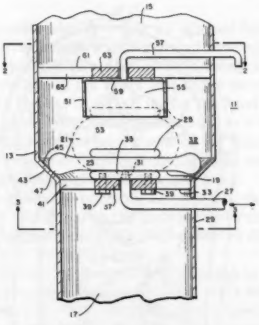
1. An adjustable waler for concrete forms, said waler comprising: an elongate angle-shaped waler panel connection plate having a first leg portion disposed for parallel attachment to a flex panel and a second leg portion disposed in right angled relationship to the first portion, said second leg portion being excised at spaced intervals to permit the first leg portion to be flexed; a pair of waler plates disposed in juxtaposition to either side of the second leg portion; and, clamping means to clamp the second leg portion between the whaler plates to selectively secure the first leg portion in an adjusted flexed condition.

4,185,806

FLUID MATERIAL FLOW CONTROL VALVE

George H. Dremann, 1940 Hopkins St., Berkeley, Calif. 94707

Continuation-in-part of Ser. No. 719,398, Sep. 1, 1976, abandoned. This application Aug. 4, 1977, Ser. No. 821,796
Int. Cl.[2] F16K 7/10
U.S. Cl. 251—61.1 **27 Claims**



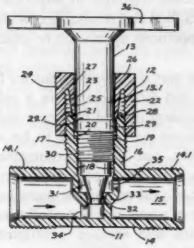
1. A fluid material flow control valve comprising
a conduit means having an inside wall surface, an inlet end and an out let end, and
a remotely inflatable valving means disposed in said conduit means and supported substantially on the axis thereof between said inlet and outlet ends, said inflatable valving means being normally deflated to present a relatively large transverse dimension and having a size and shape whereby in its deflated condition the perimeter of said valving means transversely extends to engage the inside wall surface of said conduit means to prevent fluid passage between the inlet and outlet ends thereof, and said inflatable valving means substantially freely extending in an axial direction within said conduit means when inflated so as to present a relatively small transverse dimension in its inflated condition whereby in its inflated condition the valving means contracts at its perimeter to provide a passage between its perimeter and said conduit inside wall surface to permit fluid material flow through said conduit means.

4,185,807

PLASTIC VALVE

Guy L. Milliren, Saint Louis Park, Minn., assignor to Fluoroware, Inc., Chaska, Minn.

Filed Mar. 20, 1978, Ser. No. 890,611
Int. Cl.[2] F16K 31/44
U.S. Cl. 251—218 **8 Claims**

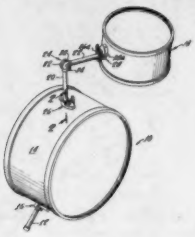


7. A shut-off valve for flowing liquids, comprising
a molded plastic valve housing having a flow-through duct and having an internally threaded valve stem mounting sleeve protruding transversely of the duct and also having a valve seat in the duct opposite the sleeve, the exterior of the sleeve also being threaded, the sleeve also having an outwardly flaring conical inner peripheral surface adjacent the outer end of the sleeve,
a molded plastic retaining nut with an internally threaded peripheral wall embracing the exterior of the sleeve and threaded thereon, the peripheral wall of the nut extending beyond the outer end of the sleeve and the nut having an annular ferrule spaced inwardly of the peripheral wall and extending endwise inwardly into the open outer end of the mounting sleeve of the housing, the ferrule having a smooth and tapered outer face engaging the conical surface at the outer end of the mounting sleeve and the ferrule being constricted by said sleeve, and
a molded plastic valve stem extending through the inner periphery of the ferrule and through the sleeve and having an inner end with a valve element within the housing and sealing against the valve seat, the valve stem being threaded into the internal threads of the sleeve and being rotatable for moving said valve element toward and away from the valve seat and the valve stem having an annular shoulder facing the end of the ferrule to engage the ferrule and be retained thereby, against removal from the housing.

4,185,808
CONNECTOR HARDWARE FOR PERCUSSIVE INSTRUMENTS

David G. Donohoe, Lakewood, and Forrest W. Clark, Fountain Valley, both of Calif., assignors to CBS Inc., New York, N.Y.

Continuation-in-part of Ser. No. 629,888, Nov. 7, 1975, abandoned, said Ser. No. 629,888, is a continuation of Ser. No. 548,571, Feb. 10, 1975, abandoned. This application Aug. 31, 1976, Ser. No. 719,249
Int. Cl.[2] F16M 13/00
U.S. Cl. 248—295 R 39 Claims



1. Apparatus for use in supporting percussion musical instruments and accessories therefor, said accessories and instruments having first and second members that are adapted to be detachably connected together in adjusted relative positions and thereafter detached and re-attached without disturbing the adjusted relative positions upon such re-attachment, said apparatus comprising:

a first connector part including means for fixedly connecting said part to said first member in a selected position of relative adjustment of said first part and first member,

a second connector part adapted to be connected to said second member, one of said connector parts having an outwardly facing surface of a non-circular configuration and the other of said connector parts having an inwardly facing surface of a non-circular configuration substantially congruent with said surface configuration of said one connector part,

said one connector part comprising a substantially C-shaped clamping element at least partially circumscribing a portion of said first member,

said clamping element including a non-circular external surface portion that forms and defines said outwardly facing surface, said clamping element including a circular main body portion of substantially uniform thickness, having an aperture extending therethrough adapted to adjustably receive said first member, having a pair of outwardly projecting juxtaposed clamp lugs, and having an outwardly projecting key, said clamping element including means for forcibly drawing said clamp lugs together to distort the clamping element main body portion into clamping engagement about a member extending through the aperture thereof,

said other connector part being adapted to slidably receive said outwardly facing surface of said one connector part in a snug, interfitting non-rotational relation,

said other connector part comprising a receiver element having a recess formed therein,

said recess having dimensions and configuration adapted to snugly and slidably receive at least a portion of said clamping element,

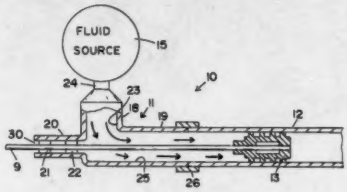
said recess of said other connector part including an outwardly projecting recess section adapted to receive said outwardly projecting key of said clamping element, said recess including a discontinuous section for receiving said juxtaposed clamping lugs, and

means for restraining withdrawal of said one connector part from said other connector part.

4,185,809
METHOD AND APPARATUS FOR PULLING LIGHTWEIGHT CABLE

Nelson Jonnes, 2620 Edgewood Ct., Stillwater, Minn. 55082

Filed Jan. 27, 1978, Ser. No. 873,013
Int. Cl.[2] B66F 3/24
U.S. Cl. 254—134.4 8 Claims



1. A method for pulling a lightweight cable from a first location to a second location comprising:

placing a tubing between the first location and the second location;

placing a pulling plug in the tubing, the pulling plug having a cable attached thereto which is to be pulled through the tubing;

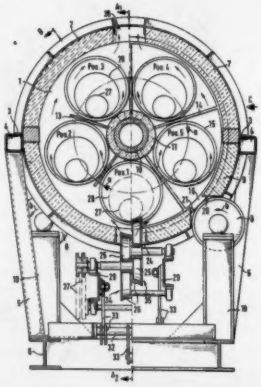
forcing liquid under pressure into the tubing to force the pulling plug and the cable through the tubing; and

placing a wiper plug in the tubing and forcing the wiper plug under gas pressure to remove the liquid in the tubing.

4,185,810
DEVICE FOR COOLING LONG ITEMS OF MATERIAL WHICH HAVE BEEN HEATED

Walter Eichenberger, Sierre, and Bernhard Hilge, Mettmenstetten, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Sep. 1, 1978, Ser. No. 939,097
Claims priority, application Switzerland, Sep. 5, 1977, 10827/77
Int. Cl.[2] F27D 9/00
U.S. Cl. 266—259 20 Claims



1. An apparatus for use in cooling heated material such as extrusion billets or the like comprising:

a cooling chamber having material inlet means and material

outlet means, said chamber including means for transporting said material within said cooling chamber;

said transporting means includes a substantially horizontal shaft means rotatably mounted within said cooling chamber and further including a plurality of support means disposed axially in spaced apart relationship along said shaft means;

each of said support means comprises a plurality of substantially ring shaped material support members radially disposed about said shaft means so that each support member of each support means is aligned with a corresponding support member on another of said support means; and

coolant medium inlet means and coolant medium outlet means associated with said cooling chamber for the ingress and egress of a cooling medium so as to bring said cooling medium in contact with said material to be cooled.

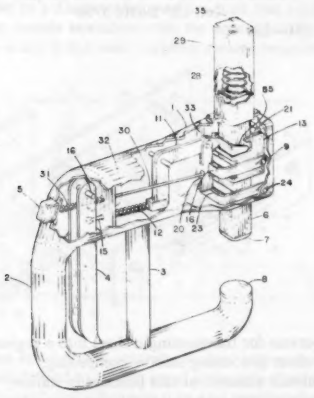
20. An apparatus according to claim **1** further including a holding furnace located in line with and immediately upstream of said material inlet means.

4,185,811

ONE HAND HELD AND OPERATED CLAMP

Howard W. Long, 1823 Sunrise Dr., Anchorage, Ak. 99504

Filed May 1, 1978, Ser. No. 901,345
Int. Cl.[2] B66F *3/00*
U.S. Cl. 269—6 **9 Claims**



1. In an adjustable clamp having a C-shaped frame, a hand grip for holding the clamp, a spring-biased hand squeeze lever adjacent to the hand grip, a fixed work holding head on one arm of the frame facing the other arm and a moveable work holding head on the end of a shaft facing the fixed work holding head, said shaft being slidably mounted in a bore of the other arm of the frame for movement of the moveable work holding head towards and away from the fixed work holding head; a clamp adjusting mechanism comprising:

a. A shaft detent means operably supported by the clamp and selectively engaged with the shaft whereby the moveable work holding head may be held at a desired distance from the fixed work holding head;

b. A shaft biasing means operably connected to the shaft so as to urge the shaft towards the fixed work holding head;

c. A first one-way clutch comprised of a driving member and a driven member wherein the driven member is operably connected to the shaft and the driving member is operably connected to the frame whereby motion of the driven member in the free-running direction of the clutch will allow the shaft to advance the moveable work holding head towards the fixed work holding head and motion of the driven member in the locking direction of the clutch will be opposed thereby opposing motion of the moveable work holding head away from the fixed work holding head;

d. A second one-way clutch comprised of a driving member and a driven member wherein the driven member is operably connected to the shaft and the driving member is operably connected to the hand squeeze lever whereby motion of the driving member in the free-running direction of the clutch will allow the hand squeeze lever to be returned from a drive stroke by the spring bias and motion of the driving member of the clutch in the locking direction of the clutch will advance the moveable work holding head towards the fixed work holding head whereby when the clamp is open with the fixed working holding head held against the work, the first squeeze of the hand about the hand squeeze lever and the hand grip with release the shaft from the detent, allowing the biasing means to advance the moveable work holding head against the work, relaxing the grip will return the driving member of the second one-way clutch for another shaft advancing stroke, and subsequent reciprocatory movement of the hand squeeze lever will advance the moveable work holding head against the work to increase the clamping force of the fixed and moveable work holding heads on the work;

e. A clutch release means comprising a push button operably supported in the hand grip so as to be operable by the thumb of the hand gripping the clamp, said push button being spring biased to extend out from the grip and a means operably connected to the push button and selectively engaged with the driving means of both clutches whereby when the push button is pressed, both clutches may be disengaged thus allowing retraction of the shaft against the shaft biasing means to open the distance between the work contacting heads;

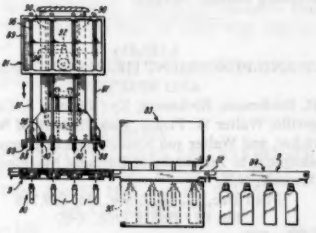
whereby the clamp can be held and controlled by one hand to be easily slipped over the work in clamp open position, closed on the work with one squeeze of the hand holding the clamp, the work clamped with the desired clamping force by successive squeezes of the hand holding the clamp, the hand removed leaving the clamp in place for the desired time interval, and the clamp released by one hand holding the clamp.

4,185,812

BLOW MOLDING PALLET ASSEMBLY FOR CONVEYING ONE OR MORE WORKPIECES

Adrian B. Hall, Fairfield, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jul. 18, 1977, Ser. No. 816,596
Int. Cl.[2] B23Q *1/18*
U.S. Cl. 269—56 **9 Claims**



5. A pallet assembly for conveying a workpiece from one location through a manufacturing operation to another location comprising the assembly of:

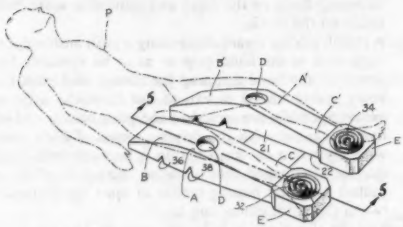
an elongated pallet shuttle constituting a base on which the other members of the assembly are mounted;

locator means on said shuttle for positively locating said shuttle relative to adjacent machine elements;

a workpiece securing and locating assembly supported on said shuttle further comprising

guide means mounted on said shuttle;
a pair of jaws for engaging a workpiece therebetween at least one of which jaws is reciprocably and adjustably mounted on said guide means to move between closed and open positions which respectively are the positions for securing a workpiece and for receiving or releasing a workpiece; and
means for biasing said jaws together;
a workpiece locating member supported on said shuttle to receive, and register a workpiece with reference to said shuttle, said jaws being arranged to reciprocate and hold a workpiece against said locating member; and
means supported on said shuttle to move the jaws apart to receive, secure, and release a workpiece.

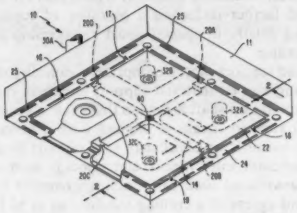
4,185,813
SURGICAL BODY POSITIONER
Donald C. Spann, 5 Ferncreek Ct., Greenville, S.C. 29601
Filed May 17, 1978, Ser. No. 906,980
Int. Cl.[2] A61G *13/00*
U.S. Cl. 269—328 **20 Claims**



1. Apparatus for positioning the body of a patient during heart surgery and the like comprising:
a pair of spaced leg supports each having a leg support surface which includes:
a resilient deformable thigh support surface having a sloping contour for properly positioning the thigh portion of said leg,
a resilient deformable calf support surface having a sloping contour for properly positioning the calf portion of said leg,
said thigh and calf support surfaces positioning said leg in an externally rotated position affording access thereto, and
a knee support portion having pressure relief means for relieving pressure on said leg in the peroneal nerve area avoiding damage thereto.

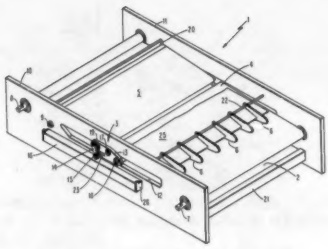
4,185,814
PICK UP AND PLACEMENT HEAD FOR GREEN SHEET AND SPACER
Albert H. Buchmann, Richmond, Ky.; Thomas J. Cochran, LaGrangeville; Walter W. Ficker, Fishkill, both of N.Y.; Alfred A. Stricker, and Walter von Kaenel, both of Pompano Beach, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 12, 1977, Ser. No. 859,778
Int. Cl.[2] B65H *3/08, 7/02*
U.S. Cl. 271—108 **7 Claims**

1. A transfer head for pick up and placement of flimsy sheets of flexible material including
a back member having a vacuum chamber formed therein, a sheet contacting lip, adapted to communicate with the vacuum chamber, to contact and retain the outer periphery of a flimsy sheet by vacuum pressure, and a non sheet contacting inner region defined within said sheet contacting lip which cooperates with the sheet when the latter is in contact with said lip to produce a vacuum pressure region that serves to support the flimsy center portion of the sheet without contact by said transfer head, and



sensing means associated with said head for detecting which of at least two types of flimsy sheets has been picked up by said transfer head.

4,185,815
SHEET FEED
Perry E. Abbott, Longmont, and Trigg Noyes, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 17, 1978, Ser. No. 887,694
Int. Cl.[2] B65H *5/00*
U.S. Cl. 271—225 **15 Claims**



7. Apparatus for transporting a sheet into a registered position on a sheet processing station, comprising:
frame means mounted at said processing station;
carriage means mounted on said frame means for reciprocal movement over said processing station;
reference means mounted on said frame means for registering a sheet; and
transport means operated by the movement of said carriage means for moving a supplied sheet to said reference means for registration, for placing said registered sheet onto said processing station, and for holding said placed sheet on said processing station.

4,185,816
SIT-UP EXERCISE APPARATUS
Morton J. Bernstein, 3636 Graystone Ave., Bronx, N.Y. 10463
Continuation-in-part of Ser. No. 777,638, Mar. 15, 1977, Pat. No. 4,116,434. This application Dec. 5, 1977, Ser. No. 857,612
The portion of the term of this patent subsequent to Sep. 25, 1995, has been disclaimed.
Int. Cl.[2] A63B *23/02*
U.S. Cl. 272—93 **13 Claims**

1. A sit-up exercise apparatus to be utilized in conjunction with a door having spaced apart vertically extending surfaces and a bottom intermediate said surfaces, said apparatus comprising:
A. frame means adapted to be removably secured to the door, said frame means comprising:

(1) an elongated base adapted to extend below said bottom of the door,

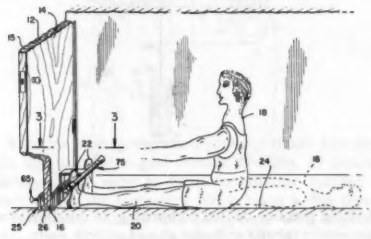
(2) front and rear members with oppositely disposed sides, each one of said members having a lower end connected to said base and an oppositely disposed upper end with spaced apart inner and outer walls intermediate said ends, said inner walls adapted to extend in overlapping relation with said surfaces of the door, and

(3) said inner walls oppositely disposed with respect to each other defining a space therebetween greater than the width of the door defined by said surfaces so as to readily permit the positionment of the door therebetween,

B. clamping means operatively connected to one of said members and extending inwardly of said inner wall for releasably clamping one of said surfaces of the door, such that said frame means is fixedly secured to the door at a selected position thereon and may be readily removed from securement therewith by releasing said clamping means,

C. supporting bar means extending generally parallel to and outwardly from one of said members on said frame means at a height above said bottom of the door so as to be readily engageable by the feet of the user of the sit-up exercise apparatus,

D. coupling means for securing said supporting means to said frame means so as to permit said supporting means to be assembled in the operative position when the sit-up apparatus is in use to a disassembled position such that said frame means may remain assembled with the door when the sit-up apparatus is not in use, said coupling means comprises:



(1) a recess substantially centrally located intermediate said sides and defined by a front panel and a pair of side panels extending substantially normal to said member for maintaining said front panel in spaced relationship to said member for forming said recess, said front panel having a free open end, and

(2) a bracket secured to said supporting means and adapted to be received within said repess in said assembled position and removed from said recess in said disassembled position,

E. said bracket includes:

(1) an upper rib extending in a substantially horizontal plane from said supporting means,

(2) a support rib coupled at one end to said upper rib and extending downwardly and substantially perpendicular therefrom,

(3) a lower rib angularly disposed relative to said upper rib and said support rib and secured therebetween,

(4) said lower rib including a neck portion extending in fixedly coupled overlapping relationship with said support rib along a portion of the length thereof with a junction therebetween, said support rib and said neck portion having a complementary configuration as said recess and adapted to be received within said recess in telescopic relation therewith,

(5) said junction is adapted to abut against said free end when in assembled position in said recess, and

(6) said recess extends vertically on said member substantially the distance between said upper and lower ends thereof,

F. locking means for releasably securing said supporting means in fixed relation to said frame means in said assembled position,

G. said locking means includes:

(1) a threaded fastener extending through said front panel, and

(2) an aperture extending within said bracket and adapted to receive one end of said fastener therein when said junction abuts against said free end of said recess such that interlocking relationship with said support rib is obtained whereby vertical movement of said supporting means relative to said frame means is prevented during use of the exercise apparatus,

H. said clamping means comprises an adjustable locking element having a threaded section extending in threaded engagement through one of said members with a shoe at one end of said section for abutting engagement with said surface of the door and a handle at the opposite end of said threaded section so as to facilitate adjustment thereof, and

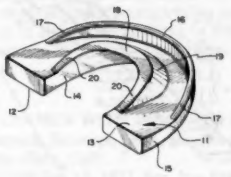
I. said supporting means includes a support element extending in a plane substantially parallel to said members for engagement by the insteps of the user of the sit-up apparatus and having spaced apart free ends.

4,185,817

TEETH EXERCISER

Eugenia N. Peterson, 4080 S. Highland Dr., Salt Lake City, Utah 84117

Filed Apr. 1, 1977, Ser. No. 783,955
Int. Cl.[2] A63B *23/00*
U.S. Cl. 272—95 **4 Claims**



1. A teeth exerciser molded in a single piece from a durable, pliant material comprising

a generally U-shaped bite portion having a flat underside, an upperside sloped upwardly from the apex of the bite portion to the ends of the legs thereof, whereby the bite portion has a constantly increasing thickness from the apex to the ends of the legs, an inner edge and an outer edge; and

flanges projecting upwardly from the bite portion at the inner and outer edges thereof.

4,185,818

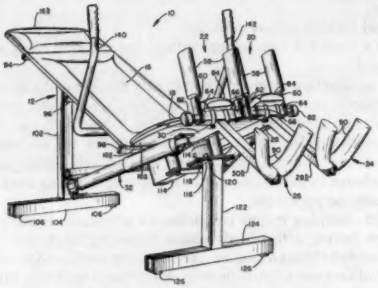
FLUID RESISTANCE TYPE LEG EXERCISER

Jerry D. Brentham, 102 Elm Dr., Belton, Tex. 76513

Filed Apr. 22, 1977, Ser. No. 790,051
Int. Cl.[2] A63B *21/00*
U.S. Cl. 272—130 **11 Claims**

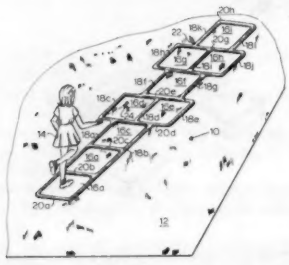
1. An exercising device adapted to strengthen abduction and adduction muscles comprising: a frame having a central axis; leg support means pivotally secured to said frame and extending outwardly from one end of said frame; leg engaging means secured to said leg support means; body support means on said frame adapted to support a human body such that the median axis of the human body is parallel to the central axis of said frame; and fluid flow resistance means secured between said leg support means and said frame resisting movement of said leg support means in a generally horizontal direction from the

sides of the body between a first position wherein the leg support means are adjacent said central axis of the frame, and



a second position wherein the extremities of the leg support means are spaced from said central axis of the frame.

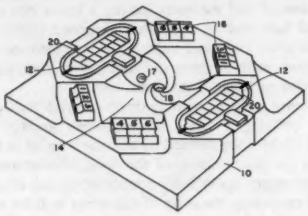
4,185,819
INFLATABLE HOPPING GAME DEVICE
Larry W. Hartley, 424 7th Ave., Santa Cruz, Calif. 95062
Filed Mar. 14, 1977, Ser. No. 777,132
Int. Cl.[2] A63B *67/00*
U.S. Cl. 273—1 A **8 Claims**



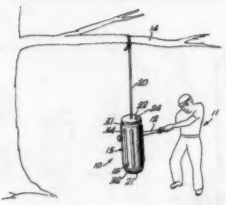
1. A hopscotch grid-providing construction comprising a series of connected air-tight tubes of plastic material which when inflated become effectively rigid and in connection define collectively said grid which may then be placed and retained directly upon a playing surface to enable hopscotch games and the like to be played therewith and further comprising a plurality of throwing markers formed as enclosed links having openable portions and linkable together into a chain for binding up said construction in a deflated condition.

4,185,820
MECHANICAL QUIZ GAME
Oded Berman, Tel-Aviv, Israel
Filed Jul. 29, 1977, Ser. No. 820,330
Int. Cl.[2] A63F *9/00*
U.S. Cl. 273—1 E **13 Claims**

1. A mechanical quiz game comprising:
a plurality of paired quiz cards, each member of each pair bearing a plurality of indicia only one of which is matchable with indicia on the other member of the pair, said matchable indicia being identifiable by coded indicia;
a race defining at the finish thereof a socket; and
manually actuable means identified with said coded indicia for indicating a response to the paired quiz cards by selectably releasing a playing element for travel along the race and into the socket.



4,185,821
HYDRO PNEUMATIC BATTING PRACTICE DEVICE AND METHOD
Silvio D. Piccini, 13620 SW. 74 Ct., Miami, Fla. 33158
Continuation-in-part of Ser. No. 667,164, Mar. 15, 1976, Pat. No. 4,093,217. This application Apr. 24, 1978, Ser. No. 899,453
Int. Cl.[2] A63B *69/40*
U.S. Cl. 273—26 R **4 Claims**



1. A batting practice device comprising, in combination,
an elastomeric tubular cylinder closed at both ends,
a mounting tube concentric with said cylinder and sealed in fluid tight relationship at its lower end to define a rope bore therein of a non-interrupted nature from end to end of the cylinder,
a filling means at the upper end of said cylinder for the injection of fluid and retention of said fluid,
a single flexible tension member inserted in the rope bore and extending upwardly to a support, and terminating at a securing element at the lower end,
said cylinder containing non-gaseous fluid to a level between 30%–70% of the volume capacity of the closed end cylinder for providing sufficient inertia to present to a bat striking against said cylinder the resistive forces of simulating striking a ball,
said tension member proportioned so that the cylinder is horizontally opposed to a major portion of the strike zone of a batter,
said support and tension member aligned so that the cylinder is vertically opposed to a major portion of the strike zone of a batter relative to an imaginary home plate,
whereby the device substantially occupies airspace defining a strike-zone.

4. A method of practicing batting including,
providing a closed end fluid retentive cylinder formed of an elastomeric material,
said cylinder characterized by unitary construction to present a non-penetratable barrier to objects striking against it,
said cylinder further characterized by having dimensions substantially defining the air space of a strike zone,

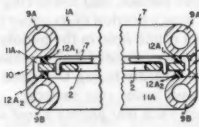
providing a longitudinal tube in the central portion of said cylinder having an uninterrupted rope bore therein,
slinging the cylinder from a support above the cylinder by utilizing a flexible tension member having means for securing the same at the lower portion of the closed end cylinder,
adjusting the length of said tension member so that the cylinder is horizontally opposed to a major portion of the strike zone of a batter,
aligning the support and tension member so that the cylinder is vertically opposed to a major portion of the strike zone of a batter relative to an imaginary home plate,
filling said cylinder to at least 30% of its interior volume with a non-gaseous fluid,
and repetitively swinging a bat by a batter against the periphery of the cylinder.

4,185,822

RACKET AND THE LIKE

Yao T. Li, Lincoln, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 695,028, Jun. 11, 1976, abandoned. This application Feb. 6, 1978, Ser. No. 875,259
Int. Cl.[2] A63B *49/02, 51/00*
U.S. Cl. 273—73 C **17 Claims**



1. A racket that comprises a primary frame attached to a handle and an oval-shaped interior opening, an oval-shaped secondary frame sized to fit in the interior opening of the primary frame, the secondary frame being a thin planar rim with an interior window and being rigid with respect to inwardly-directed forces in the plane of the rim,
a plurality of strings secured in required tension by the secondary frame and disposed within said window to define a string surface within said window, and
means coupling the secondary frame securely within the interior opening of the primary frame, to maintain planar stability of the secondary frame and to transmit orthogonally-directed forces upon the string surface to the primary frame, but not the tension forces of the strings, said tension forces being taken primarily by the secondary frame, said means coupling being a coupling system comprising elastomer means, said primary frame having an internal channel to receive the elastomer means, the peripheral edge of the planar rim that constitutes the secondary frame being securely held within the elastomer means, the plane of the rim being parallel to the string surface.

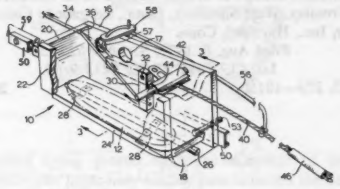
4,185,823

BICYCLE GAME DEVICE AND METHOD OF PLAYING GAMES THEREWITH

Bruce R. Brown, Welland, Canada, assignor to B & D Trailer Company Limited, Welland, Canada

Filed Jan. 6, 1978, Ser. No. 867,461
Int. Cl.[2] B62J *39/00*
U.S. Cl. 273—95 R **5 Claims**

1. Apparatus forming part of or adapted for attachment to a wheeled vehicle such as a bicycle or similar vehicle, for use in recreational activities, said apparatus comprising:
a main carrier frame adapted to or forming part of a bicycle, said main carrier frame defining a confinement for an object and having;
a support member for releasably receiving an object, said support member being movable between a first, object engaging position and a second, object releasing position; and
actuating means for moving said support member from said first object engaging position to said second, object releasing position,
said support member being movably arranged with respect to the underside of the main carrier, and said actuating means including a lock bar adapted to engage and retain the support member and its first, object engaging position,



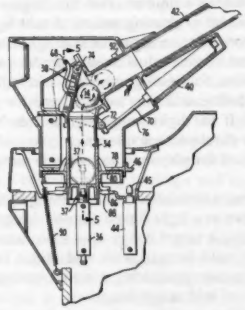
and at least one actuating line attached to the lock bar and adapted to move the lock bar out of engagement with the support member to allow movement of the support to its second, object releasing position, and
wherein said support member comprises a generally flat plate pivotally mounted on an off-centre shaft to said main frame, said shaft effectively dividing the plate into a major area portion and a minor area portion, the lock bar in the first, object engaging position engaging the upper surface of the major area portion of said plate to retain the plate in substantially horizontal disposition, the lock bar in the second, object releasing position being moved clear of the plate so as to allow gravity tilting of the plate about said shaft to assume its second, object releasing position.

4,185,824

BALL LAUNCHER WITH FINGER SPIN LOADING

Vernon R. Natwick, Saratoga, Calif., assignor to Ramtek Corporation, Santa Clara, Calif.

Filed Jul. 11, 1977, Ser. No. 814,329
Int. Cl.[2] A63B *63/00*; F41F *27/00*
U.S. Cl. 273—101 **5 Claims**



1. An amusement game comprising a target, a plurality of balls, an operator fired gun for shooting the balls toward the target, means for automatically returning the balls from the target to the gun, means for automatically loading one ball at a

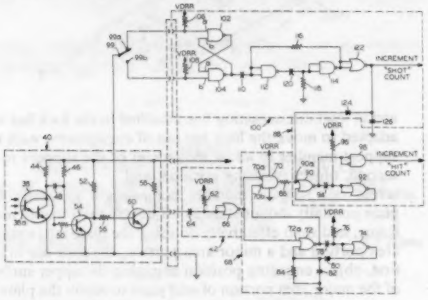
time into the gun for firing, and wherein the gun has a breech for receiving each ball as it is loaded into the gun, a breech door, and the automatic ball means load the balls from below into the gun breech, and further including a resilient finger mounted on the breech door for imparting a rotational force to each ball upon loading, while simultaneously deflecting each ball to contact the top, interior portion of the gun breech, to cause the ball to spin into the gun breech, whereby each ball is caused to positively roll itself into the gun breech by rotational inertia, upon loading.

4,185,825

TELEVISION TARGET GAME AND METHOD

Eric Bromley, West Simsbury, Conn., assignor to Coleco Industries, Inc., Hartford, Conn.

Filed Aug. 8, 1977, Ser. No. 822,151
Int. Cl.[2] F41F *27/00*; F41J *9/00*
U.S. Cl. 273—101.2 **26 Claims**



1. In a target game utilizing the screen of a cathode ray tube to present a light image, the combination comprising:

A. a simulated firearm including:

(1) light sensing means,

(2) sighting elements aligned with said light sensing means; and

(3) a trigger mechanism,

said light sensing means generating a signal when said sighting elements are aligned with a light image; and

B. a control assembly including:

(1) hit evaluating means including means for receiving the sensed light image signal from said light sensing means, for establishing predetermined maximum duration, for establishing a time interval that begins upon reception by said hit evaluating means of said light image signal and ends after reception of said light image signal by an amount of time equal to said predetermined maximum duration, for testing whether said light image signal ends before said time interval, and for generating a hit signal if the light image signal ends before the maximum-duration time interval.

22. A method for playing a target game using a video screen comprising:

A. providing a simulated firearm having light sensing means responsive to a light image aligned therewith;

B. generating a target image on a video screen;

C. aligning said firearm with said target image, said light sensing means generating a signal corresponding to the duration of said target image;

D. establishing a predetermined maximum duration;

E. establishing a time interval that begins upon reception by said hit evaluating means of said light image and ends after reception of said light image signal by an amount of time equal to said predetermined maximum duration;

F. testing whether said light image signal ends before said time interval; and

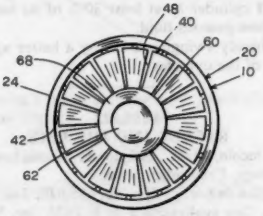
G. registering a hit if the light image signal ends before the maximum-duration time interval.

4,185,826

CIRCULAR BUTTERFLY

Ming-Shean Ueng, 740 W. End Ave., Apt. 135, New York, N.Y. 10025

Filed Jun. 27, 1977, Ser. No. 810,035
Int. Cl.[2] A63B *65/10*
U.S. Cl. 273—106 B **11 Claims**



1. A throwing implement comprising, a circular saucer having a round surface, a circular rim about the outer periphery of said round surface, a lower ring surface about the inner periphery of said round surface, said lower ring surface having corrugations over at least a portion of its upper face, said lower ring surface defining a round hole in the middle of said throwing implement, a plurality of radial holes in said circular rim, and a plurality of downwardly facing U-shaped radial grooves in the lower face of said lower ring surface;

a plurality of leaves, each leaf having a leaf surface secured to an axle intermediate the ends of said axle, an outer end of each axle being mounted in one of said radial holes and an inner end of each axle being mounted in a corresponding one of said U-shaped radial grooves;

means for retaining the inner ends of said axles in said U-shaped radial grooves; and

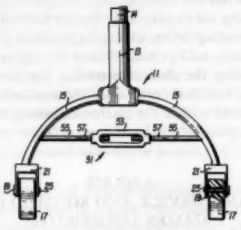
adjusting means for changing the angle of attack of said leaves with respect to the plane of said round surface.

4,185,827

ADJUSTABLE SHUFFLEBOARD CUE HEAD HAVING SWIVEL RUNNERS

Samuel H. Allen, 13299 86th Ave. North, Seminole, Fla. 33542

Filed Jan. 30, 1978, Ser. No. 873,752
Int. Cl.[2] A63B *71/00*
U.S. Cl. 273—129 B **8 Claims**



8. A shuffleboard cue head for propelling a disc along a shuffleboard court comprising:

an adjustable forked frame adapted for mounting to a handle and having forwardly extending resilient arms laterally spaced from one another;

disc engaging means comprising blocks having edges which intersect at substantially right angles to one another, support means pivotally mounting said disc engaging means

at the forward end of each of said arms, said support means comprising, for each block, a pair of laterally spaced arms between which extends a detachable pin;

a frame adjustment means for controlling the lateral distance between said disc engaging means; said frame adjustment means comprising a turnbuckle which threadingly engages a pair of rods which extend between, and are attached, to said laterally spaced resilient arms respectively.

4,185,828

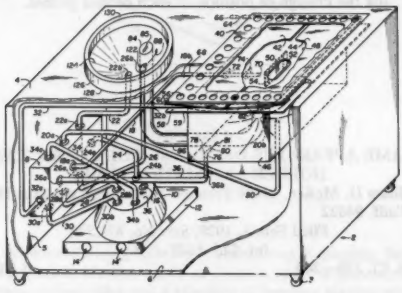
MACHINE AIR PRESSURIZED GAME

Lazaro Fernandez, 263 Willis Ave., Mineola, N.Y. 11501

Filed Oct. 11, 1977, Ser. No. 840,607

Int. Cl.[2] A63F *3/06, 5/04*

U.S. Cl. 273—142 J **13 Claims**



1. A game machine comprising chamber means for receiving therein at least one lot member, valve means for controlling a supply of forced air to said chamber means, means cooperating with said valve means for agitating said lot member in said chamber means so that it freely whirls about said chamber means, and means for capturing and positioning said lot member at random at a location at which a value characteristic of the lot member at said location is displayed, said valve means comprising a self-contained unitary multi-way valve assembly having at least one positive air pressure supply inlet, a multiplicity of positive air pressure outlets each connectible to inlet ends of tubes for supplying air to perform different functions in the game machine, and separate actuators for individually controlling the egress of air from said outlets, said agitating means comprising a first tube having an inlet end connected to one of said valve outlets and an outlet end connected to said chamber means for blowing air in a horizontal direction, and a second tube having an inlet end connected to one of said valve outlets and an outlet end connected to said chamber means for blowing air in a vertical direction.

4,185,829

CHANCE DEVICE MOUNTABLE ON PHONOGRAPH TURNTABLE

Ben Long, 4911 Brooklyn Blvd., Minneapolis, Minn. 55429

Filed May 19, 1978, Ser. No. 907,720

Int. Cl.[2] A63F *5/02*

U.S. Cl. 273—142 K **6 Claims**

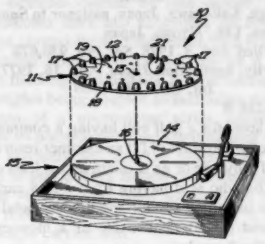
1. A game device adapted to be positioned on the turntable of a phonograph, said game device including:

a circular, substantially flat game structure corresponding to the turntable of a phonograph, said body having a centrally located opening therein for accommodating the post of the turntable therethrough,

a light weight ball adapted to be dropped on the game structure when the latter is rotated while positioned on the turntable,

a plurality of similar post elements affixed to the game structure adjacent the circumference thereof and projecting upwardly therefrom, said post elements being equally spaced apart, the spacing between adjacent posts being less than the diameter of the ball,

a plurality of similar spaced apart deflector elements affixed to said game structure and projecting upwardly therefrom, said deflector elements being spaced inwardly from the post elements, the spacing between adjacent deflector



elements being greater than the diameter of the ball whereby the latter may readily pass between the adjacent deflector elements,

and indicia affixed to the upper surface of the game structure adjacent the circumference thereof, each indicium being located between adjacent pairs of said posts.

4,185,830

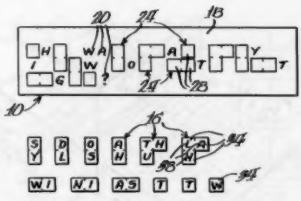
WORD PUZZLE GAME

David B. James, 431 Dawn Ave., Glen Ellyn, Ill. 60137

Filed May 8, 1978, Ser. No. 903,902

Int. Cl.[2] A63F *9/10*

U.S. Cl. 273—157 R **7 Claims**



1. A puzzle to be solved to form a predetermined intelligible collocation of language symbols, said puzzle comprising:

a puzzle base, said puzzle base having at least one row of language symbols at fixed locations in each row, said symbols being adapted to be read seriatim from one end to the other of each said row, said base further having a plurality of template outlines of various planar shapes and sizes, said template outlines located in fixed positions among the language symbols on said puzzle base and

a plurality of movable elements, various ones of said movable elements corresponding in shape and size to various ones of said template outlines and adapted to be superimposed in registry thereon, at least one of said movable elements further having at least one language symbol display area presenting a language symbol therein, each said language symbol area of all said movable elements being indentical in size and shape whereby, when all of said movable elements are arranged in predetermined locations upon said puzzle base and properly superimposed in registry on said template outlines of the same shape and size, the language symbols in said language symbol display areas on said movable elements cooperate with the language symbols on said puzzle base to form said predetermined intelligible collocation of language sym-

bols when read seriatim from one end to the other of each said row.

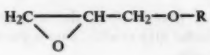
4,185,831

COMPOSITION FOR THE OUTER LAYER OF A GOLF BALL

Ichiro Tominaga, Kakogawa, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Aug. 3, 1978, Ser. No. 930,678
Claims priority, application Japan, Aug. 16, 1977, 52-98036
Int. Cl.² C08F *8/08*
U.S. Cl. 273—235 R **10 Claims**

7. An outer layer for a golf ball having a composition comprising the reaction product of (1) an ionomer resin comprising a copolymer of ethylene or an α-olefin and at least one unsaturated monocarboxylic acid having from 3 to 8 carbon atoms, said copolymer including thermo-modifiable metal cross-linkages therein, and (2) ethylene oxide or a monoepoxy compound having the formula:



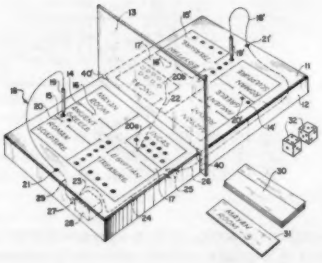
wherein R is alkyl, haloalkyl, alkenyl, cycloalkyl or phenyl.

4,185,832

POSITION MATCHING BOARD GAME APPARATUS

Michael G. Traficante, 12031 Student Dr., Apt. C-18, Orlando, Fla. 32807

Filed Aug. 2, 1978, Ser. No. 930,369
Int. Cl.² A63F *3/00*
U.S. Cl. 273—237 **6 Claims**



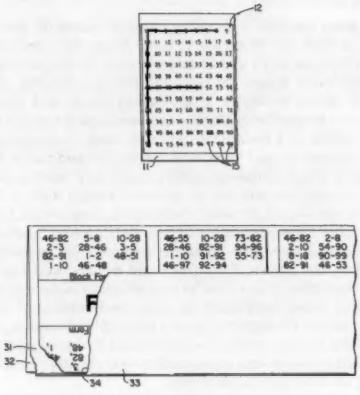
1. A game apparatus comprising:
(i) a baseboard;
(ii) view-blocking means mounted on said board dividing said board into first and second sections;
(iii) said first and second sections having design means thereon subdividing each into a pluraity of spaces and interconnecting openings and passageways, each section bearing identical complementary design means whereby for every space opening and passageway on the first board section there is a corresponding space opening and passageway in the second;
(iv) a plurality of circuit terminal connectors located on said baseboard within said subdivided spaces, openings and passageways, each of said connectors defining a position in the first section corresponding to an identical connector position in the second section to form a complementary pair each of said complementary pair of connectors electrically interconnected;
(v) at least two electrical probes one on each of said first and second board sections for mating with the electrical connectors thereon;
(vi) electrical conductive means connecting said probes to a source of electrical energy;
(vii) electrical indicator means connected in series with said electrical energy source and probes whereby when at least one probe on each of said first and second sections of the board has been inserted into a complementary pair of connectors there is an electrical circuit completion actuating said indicator means;
(viii) at least one set of instruction cards having a primary and a secondary surface, the secondary surface of all cards being identical, and the primary surface bearing design means corresponding to one of said plurality of spaces on said first and second boards, said primary surface thereby bearing instructions regulating the location and relocation of at least one of said probes;
(ix) a chance numerical designator means alternately regulating the change of position of each of said probes.

4,185,833

GAME APPARATUS INCLUDING CODE CARD, CARD HOLDER AND MATRIX SHEET

William D. McKee, 13888 Fremont Pines La., Los Altos Hills, Calif. 94022

Filed Feb. 1, 1978, Ser. No. 874,345
Int. Cl.² A63F *3/00*
U.S. Cl. 273—240 **1 Claim**



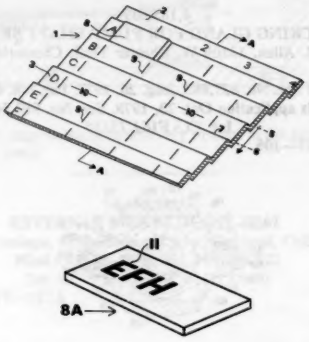
1. Game apparatus comprising, in combination;
a sheet provided with at least an ordered matrix,
at least one coded representation card having at least one coded portion made up of a plurality of character combinations,
each character combination designating part of said coded matrix on said sheet and each character combination corresponding to a section of a representation to be reproduced on said ordered matrix,
all of said character combinations translatable onto said sheet thereby establishing said representation on said sheet
said card including a representation portion on which said representation is reproduced and which is separate from the coded portion and
a card holder having a portion adapted to receive and support said card with the coded portion exposed and having a cover portion covering said representation portion of said card when said card is supported on said holder.

4,185,834

WORD FORMING GAME

Catherine M. C. Mozzi, and Helmut Mozzi, both of 32/6-14 Darley St., Darlinghurst, Sydney, New South Wales, Australia (2010)

Filed Jun. 19, 1978, Ser. No. 916,465
Claims priority, application Australia, Jun. 30, 1977, PD0640
Int. Cl.[2] A63F 3/00
U.S. Cl. 273—241 8 Claims



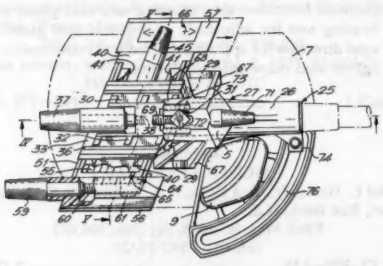
1. A word-forming game kit comprising a playing field having marked thereon a grid of discrete areas, a plurality of blanking playing tiles and a plurality of lettered playing tiles, the lettered playing tiles together representing at least a substantial portion of the alphabet, each discrete area on the playing field being dimensioned to accommodate a single playing tile only, characterized in that each lettered playing tile bears on at least one face thereof a minimum of two different letters of the alphabet and in that a second face of each lettered playing tile is identical to said one face except for background color of said second face.

4,185,835

GRAMOPHONE PICK-UP ARMS

Alastair J. Robertson-Aikman, Stokes, Steyning, Sussex, England

Filed Jun. 5, 1978, Ser. No. 912,779
Claims priority, application United Kingdom, Jun. 9, 1977, 24233/77
Int. Cl.[2] G11B 3/10
U.S. Cl. 274—23 R 21 Claims



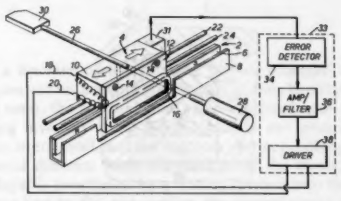
1. A gramophone pick-up arm comprising
(a) an arm proper;
(b) a headshell attached to one end of said arm for carrying a pick-up cartridge;
(c) a bearing arrangement associated with said arm for providing for rotation of said arm about a vertical axis and for pivotal movement of said arm about a horizontal axis;
(d) a balance weight arrangement associated with the other end of said arm, said balance weight arrangement comprising a main balance weight component constituted by a balance weight carrier together with individual balance weight elements carried by said carrier, said elements being selected inter alia according to the mass of the cartridge carried by said headshell, and a subsidiary balance weight component constituted by a pair of rider weights flanking said balance weight carrier, one of said rider weights being coupled to said balance weight carrier by means of a micrometer screw adjustment means, whereby its position relative to said balance weight carrier can be precisely set, and the other rider weight being coupled to said balance weight carrier by indexable means enabling the said other rider weight to be set to first and second predetermined positions relative to said main balance weight carrier; and
(e) adjustable mounting means adjustably coupling said balance weight carrier to the said other end of said arm, whereby the position of said balance weight arrangement relative to the bearing arrangement can be varied.

4,185,836

DISC RECORD PLAYER

Brian P. Taylor, and Khalid O. Chaudry, both of Swindon, England, assignors to Plessey Handel und Investments AG, Zug, Switzerland

Continuation-in-part of Ser. No. 831,169, Sep. 7, 1977, abandoned. This application Jun. 14, 1978, Ser. No. 915,546
Claims priority, application United Kingdom, Sep. 9, 1976, 37322/76; Mar. 19, 1977, 11746/77
Int. Cl.[2] G11B 3/10; H02K 41/00
U.S. Cl. 274—23 A 14 Claims



1. A disc record player including a pickup arm for tracking a disc record, said record player comprising feedback means responsive to at least one of velocity and acceleration of the pickup arm for producing a motor control signal, and means including a linear type electric actuating motor responsive to said motor control signal for causing said pickup arm to tangentially track said record.

4,185,837

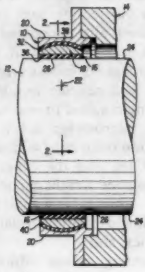
FLUID SEAL WITH LUBRICATED SEALING SURFACES

Jerome Greene, 1241 Barclay Ct., Westlake Village, Calif. 91361

Filed May 5, 1978, Ser. No. 902,947
Int. Cl.[2] F16J 15/12
U.S. Cl. 277—27 10 Claims

1. A seal for sealing against fluid leakage between a pair of relatively moving machine elements comprising a continuous elastomer seal connected in sealing relationship to one of the machine elements for movement therewith, the seal having a continuous elastomer layer including an elastomer sealing surface adapted to slidably engage a continuous rigid sealing surface on the other machine element; a plurality of shaped rigid members embedded in said elastomer layer beneath the elastomer sealing surface in a consecutive, closely spaced

arrangement along the direction of relative movement between the machine elements; a support means for the elastomer layer; said support means including individual support surfaces located directly behind each of the shaped rigid members, each



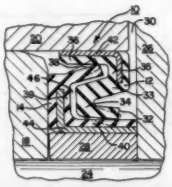
rigid member having a rear surface, each support surface and one adjacent rear surface of a rigid member defining a surface pair, each surface pair being curved about a mutual center or centers of spherical curvature that is or are located on a radius line extending towards the other machine element.

4,185,838

TWO-ELEMENT LIP-TYPE SEAL

Bill A. Danner, Rochester, Ill., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Nov. 25, 1977, Ser. No. 855,025
Int. Cl.[2] F16J *15/32*
U.S. Cl. 277—58 **5 Claims**



1. A seal assembly, having an annular configuration adapted to form a barrier against damaging material which may enter bearing areas of relatively rotatable components of a pivot joint in a track linkage, or like mechanical joint, having a bushing forming component mounted for rotational and limited axial movement on a pivot pin forming component the ends of which are secured in associated end support members, said seal assembly comprising

a pair of annular seal elements adapted to be arranged in axially inner and outer relationship and to be disposed in a recess in the bushing end face and between confronting radially spaced face portions of said pivot pin and said bushing end,

said inner and outer seal elements, when seated in said recess, having radially spaced support portions seated in fixed relation on said confronting radially spaced face portions,

said inner and outer seal elements having integral resilient deformable lip formations thereon which extend axially in radially spaced relation to the associated face portion and to each other, and

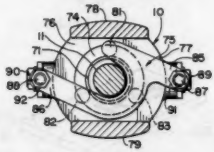
each of said lip formations on said pair of seal elements extending in a recess formed in the associated seal element in an area between the lip formation and the support face portion of said associated seal element and engaging in seal forming relation with said support face portion of said associated seal element, thereby forming a closed annular compartment in the form of a labyrinth which is defined by said lip formations and adjoining portions of the respective seal elements which are in confronting relation and which extend between the seal forming engagement of said lip formations with said support face portions.

4,185,839

PACKING GLAND FOR PUMP SHAFT SEAL

Clifford H. Allen, 13109 W. Chester Trail, Chesterland, Ohio 44026

Division of Ser. No. 827,883, Aug. 26, 1977, Pat. No. 4,140,444.
This application Oct. 23, 1978, Ser. No. 953,540
Int. Cl.[2] F16J *15/16*
U.S. Cl. 277—105 **2 Claims**



1. In a shaft seal assembly for use in association with a rotary shaft within a housing therefor, and adapted for mounting around a portion of the shaft to provide a seal between forward and rearward spaces around the shaft, said shaft seal assembly including a plurality of packing seal elements positioned around said shaft portion adjacent one another between a forward seal element and a rearward seal element, the improvement which comprises:

means for axially retaining said forward seal element,

means defining a pair of opposed openings in said housing communicating with said rearward space,

a seal gland adapted to be moved laterally through one of said openings to and from a seal retaining position and including

a central crescent-shaped portion adapted to be laterally removably positioned partially around said shaft,

a plurality of symmetrically spaced gland sleeve compression buttons on said central portion adapted to bear in an axial direction against said rearward seal element, and

a pair of end portions located on opposite sides of said central portion and extending radially outward through said openings, and

means outside of said housing and engageable with said end portions for removably securing said seal gland to said housing and for adjustably urging said seal gland in an axial direction for applying desired seal compression force against said rearward seal element.

4,185,840

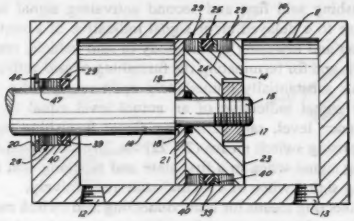
MULTILAYER SEAL

Daniel L. Hertz, Jr., Red Bank, N.J., assignor to Seals Eastern Inc., Red Bank, N.J.

Filed May 10, 1978, Ser. No. 904,652
Int. Cl.[2] F16J *15/20*
U.S. Cl. 277—125 **7 Claims**

1. A multilayer seal comprising a stack of rings, some of said rings being made of elastomeric material and some being made of more rigid material, the elastomeric and rigid rings alternating in the axial direction of the stack, each of said rigid rings being discrete and the seal being devoid of rigid force transmitting means between said rigid rings, each of said elastomeric

rings being discrete and unconnected to any other elastomeric ring outside of the rigid rings which separate them, and the



elastomeric rings being progressively thinner in the axial direction of the stack.

4,185,841

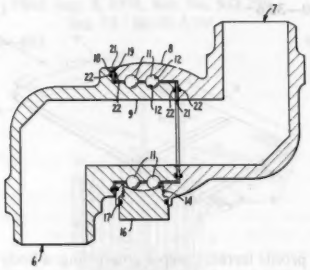
EXTERNAL SWIVEL JOINT SEAL

Ben W. Brundage, 4390 Piedmont Ave., Oakland, Calif. 94611

Filed Oct. 30, 1978, Ser. No. 956,023

Int. Cl.[2] F16J *15/34*; F16L *55/00*

U.S. Cl. 277—167.5 **1 Claim**



1. A seal for two elements rotating one with respect to the other and having mating surfaces movable one with respect to the other, a TEFLON washer provided between the mating surfaces with an "O" ring on each side thereof in each of the elements providing the mating surfaces, the washer being made of TEFLON and the "O" rings made of VITON.

4,185,842

SEAL RING

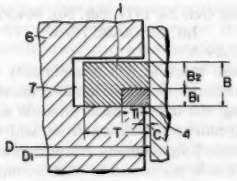
Kentaro Magara, Urawa, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Jul. 10, 1978, Ser. No. 923,287

Claims priority, application Japan, Jul. 8, 1977, 52-91467

Int. Cl.[2] F16J *9/20, 9/02*

U.S. Cl. 277—194 **1 Claim**



1. In a gapped composite seal ring for a Stirling engine of the type having a main seal ring with an annular recess formed in the outer periphery thereof opposite the high pressure side of said main seal ring to form an L-shaped cross-section, and an auxiliary seal ring fitted into said annular recess, said composite ring sealing the clearance gap between the outer periphery of a piston and the inner periphery of a cylinder, the improvement comprising:

said main and auxiliary seal rings being made of thermoplastic or thermosetting synthetic resin, the axial thickness of the thin wall portion of the main seal ring being substantially between one-half and three-fourths the axial thickness of the entire composite ring and the radial width of said auxiliary seal ring being at least twice as large as said clearance gap and less than four-fifths of the radial width of the entire composite seal ring.

4,185,843

FRICTION WEAR EXPERIENCING MACHINE PART HAVING A COATING ON ITS SLIDING SURFACE

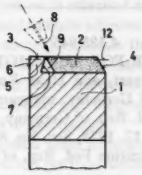
Horst Beyer; Ulrich Buran, both of Burscheid, and Hans-Joachim Neuhäuser, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Jun. 23, 1978, Ser. No. 918,439

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1977, 2728725; Jan. 27, 1978, 2803568

Int. Cl.[2] F16J *9/02, 9/12*

U.S. Cl. 277—224 **18 Claims**



1. In a machine part having one surface arranged to be in sliding contact with a cooperating part to thus be subjected to friction wear, the machine part being provided with a recess extending inwardly from the one surface and presenting at least one lateral wall, and the machine part comprising a layer of material different from the material of the machine part, which layer is constituted by a coating sprayed into the recess and extending to the one surface, the improvement wherein said layer is held in said recess in a manner such that no bond exists between said layer and said lateral wall.

4,185,844

FUEL TANK FILLER TUBE ASSEMBLY

Earl Hubbard, Madison Heights, and Robert J. Kartanys, Royal Oak, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Apr. 24, 1978, Ser. No. 899,685

Int. Cl.[2] B67C *3/00*

U.S. Cl. 280—5 A **4 Claims**

1. A filler tube assembly for a fuel tank installed in a vehicle, the assembly comprising:

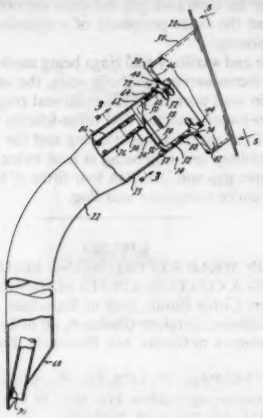
A. a housing having a fuel delivery passage formed therethrough and having flange means for fixedly attaching to a portion of the body of the vehicle;

B. a fuel delivery tube secured to said housing at one end and providing wall means for connection to the fuel tank at the other end;

C. vent tube connecting means defining a cylindrical vent tube mounting boss extending from said housing into said fuel delivery tube;

D. vent tube retaining means integrally formed with said fuel delivery tube on its inner periphery adjacent said other end; and

E. a flexible vent tube flexibly insertable within said fuel delivery tube and received in interference sealing engagement with said vent tube boss at its one end and received for retention at its other end by said retaining means.



4,185,845

LEVEL REGULATOR FOR AUTOMOTIVE VEHICLES

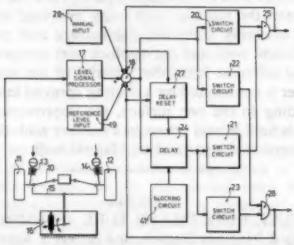
Wolfgang Misch, Stuttgart, and Hans Kubach, Konntal-Mu, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 12, 1978, Ser. No. 895,767

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1977, 2716476

Int. Cl.[2] B60G *17/04*

U.S. Cl. 280—6 H **15 Claims**



1. In a motor vehicle having an axle **(10)** and a vehicle body, level controllable spring means intercoupled between said body and said axle for raising and lowering said body with respect to said axle upon, respectively, pressure increase and pressure decrease in said spring means, level regulator means cooperating with said spring means for increasing and reducing the pressure therein in response to a first and second activating signal, respectively,

means **(16, 17)** continuously furnishing an actual level signal indicative of the actual level of said body of said vehicle;

a regulating system comprising

error signal furnishing means **(49, 51; 49, 40)** continuously furnishing an error signal indicative of the magnitude and direction of said actual level of said body of said motor vehicle relative to a reference level;

delay means **(24)** connected to said error signal furnishing means, for furnishing a delayed error signal with a predetermined delay time interval following receipt of said error signal;

and activating signal furnishing means **(20, 23, 25, 26)** for furnishing said first and second activating signal in response to a delayed error signal indicative of a required raising and lowering of said body of said vehicle, respectively, and for terminating the furnishing of said activating signals substantially immediately upon receipt of a zero error signal indicative of an actual level equal to said reference level, said activating signal furnishing means comprising switch means **(20, 22)** for furnishing said activating signal when in a first state and blocking said activating signal when in a second state respectively,

and connecting means for interconnecting said switch means between said error signal furnishing means and said delay means in such a manner that said switch means is switched from said second to said first state only in response to said delayed error signal and from said first to said second state when said error signal is indicative of zero error.

4,185,846

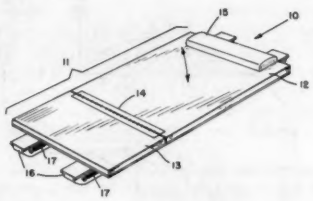
ROUGH TERRAIN CREEPER

Odell D. Black, Rte. 1, Box 303, Lexington, N.C. 27292

Filed Sep. 26, 1977, Ser. No. 836,603

Int. Cl.[2] B62B *11/00*

U.S. Cl. 280—32.6 **11 Claims**



1. A low profile terrain creeper comprising: a body support member suitably adapted for lying thereon, a ground engaging track means, said track means being guidably connected to said body support member for longitudinal parallel movement thereto, said body support member being movable beyond said track means to an extended position from a longitudinal aligned position, and a resilient member, said resilient member being joined to said track means and to said body support member for urging said track means from said extended position to said aligned position whereby the creeper can be walked along by successively extending and aligning said body support member relative to said track means.

4,185,847

SKATEBOARD TRUCK WITH INDEPENDENT WHEEL SUSPENSION

Robert D. Johnson, 7882 Cedar Lake Ave., San Diego, Calif. 92119

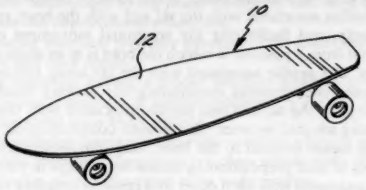
Filed Oct. 25, 1977, Ser. No. 844,973

Int. Cl.[2] A63C *17/02*

U.S. Cl. 280—87.04 A **11 Claims**

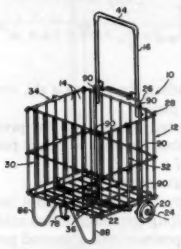
4. A skateboard truck in which a plurality of wheels are mounted for rotation about axles extending laterally outwardly from a mounting, the improvement wherein said wheels are carried in independent suspension from said mounting and comprising separate longitudinally extending swing arms associated with each axle connected to said mounting and to the axle associated therewith, means for resiliently biasing each of said axles toward a position longitudinally displaced from the interconnection of the associated swing arm with said mounting, said swing arms being rotatably connected to said mount-

ing, said mounting including pivot means for carrying the wheel axis for pivotal movement about an axis inclined in a



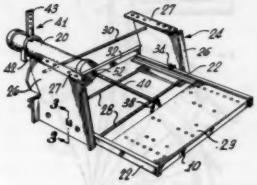
plane extending longitudinally through the truck for steering action.

4,185,848
SHOPPING CART
Gilbert J. Holtz, 182 Tibbetts Rd., Yonkers, N.Y. 10705
Filed Aug. 9, 1978, Ser. No. 932,279
Int. Cl.[2] B62B *1/04*
U.S. Cl. 280—652 **4 Claims**



1. A shopping cart comprising, in combination, a folding basket and a two-part inverted U-shaped pushing handle for said cart consisting of a handle upper and lower parts, said folding basket being in attached supported relation on said handle lower part and being comprised of a cooperating arrangement of a back wall, a front wall, a pair of opposite side walls, and a bottom panel, said back wall being supported on said handle lower part and there being pivotal connection means therefrom to said side walls and bottom panel so as to operatively mount same to partake of pivotal movement in flush relation against said back wall preparatory to providing a compact storage condition in said cart, said handle upper part presenting a hand grip and being pivotally connected adjacent the upper end of said handle lower part so as to be pivotally movable between operative and storage positions in relating thereto, and at opposite facing locations on the lower end portion of said handle lower part a cooperating pair of wheel supporting axles, one said axle of each pair being oriented transversely of the pushing direction of said cart for rotatably supporting wheels of said cart during said pushing movement thereof, said other axle of each pair being oriented in said cart pushing direction for receiving said wheels in mounted storage positions thereon in a corresponding perpendicular orientation, whereby said wheels in said storage position are held in the same flat condition as said handle and as said folded basket thereon to thereby contribute to a compact storage condition in said cart.

4,185,849
RETRACTABLE STEP FOR MOTOR VEHICLE
Wilbert J. Jaeger, 1219 Opal Ave., Anaheim, Calif. 92805
Filed Feb. 3, 1978, Ser. No. 874,834
Int. Cl.[2] B60R *3/02*
U.S. Cl. 280—166 **7 Claims**



7. For use with a motor vehicle, an automatically extendable and retractable step for mounting and alighting from said vehicle, said step comprising:

a pair of generally rectangular, vertically disposed, laterally spaced side members each attached at its upper end to an undercarriage of said vehicle adjacent a door of said vehicle, and attached to each other at their lower ends by a plurality of transverse bearing rods, and further attached to each other at their rearward ends by a transverse cylinder mounting brace, said side members, bearing rods and brace forming a box-like frame;

a substantially horizontal plate arranged to be reciprocally received in a retracted position within said frame, and in an extended position in front of said frame, said plate supported at its lateral sides by a pair of elongated channel members extending into said frame when said plate is disposed in front of said frame, and disposed above said transverse bearing rods and below said cylinder mounting brace;

a pneumatic cylinder mounted at one end on said brace substantially midway between said side members, and secured at its other end to said undercarriage of said vehicle, and having a spring biased piston reciprocally disposed therein and operatively connected to said plate by a connecting rod for moving said plate between said retracted and extended positions, said spring biasing said piston forwardly to move said plate to said extended position when both sides of said piston are exposed to atmospheric pressure;

a passage communicating a rearward region of said cylinder with an intake manifold of an internal combustion engine of said vehicle for exposing a rearward side of said piston to sub-atmospheric pressure when said engine is operating, thereby causing said piston to move said plate, against the force of said spring, to said retracted position;

a valve means disposed in said passage for permitting air to flow from said region of said cylinder to said intake manifold, and preventing flow of air from said intake manifold to said region of said cylinder; and

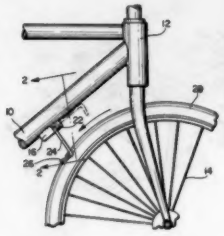
a second valve means for selectively communicating said region of said cylinder with a supply of atmospheric pressure, said second valve means being controlled by said door of said vehicle such that said region of said cylinder communicates with said supply of atmospheric pressure when said door is open, and said region of said cylinder does not communicate with said supply of atmospheric pressure when said door is closed.

4,185,850

AUTOMATIC RELEASE BICYCLE HOLDER

Edward H. Levine, 76 Locust St., Providence, R.I. 02906, and F. E. Dixon Newbold, 9 Tilley Ave., Newport, R.I. 02840

Filed Nov. 16, 1978, Ser. No. 961,295
Int. Cl.[2] B62H *3/04*
U.S. Cl. 280—296 **10 Claims**



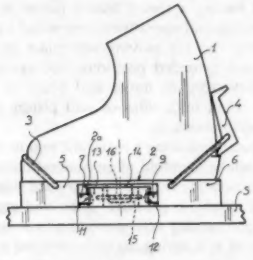
1. An automatic release bicycle holder comprising a rectangular block of material forming a base, means for mounting said block beneath the bicycle frame bar which extends downwardly and rearwardly from the front fork at a point adjacent the front wheel and tire, the lower forward corners of said block being cut out to form rectangular cut out portions on each side, a pivot opening on each side extending inwardly in said cut out portions in axial alignment, and a spring wire frame pivotally mounted in said openings, said cut-out portions limiting the pivotal movement of said spring wire frame, said frame engaging the front wheel tire to hold the front wheel against rotation or turning when said frame is pivoted downwardly against the front tire.

4,185,851

PIVOTING SAFETY BINDING FOR SKI

Georges P. J. Salomon, Annecy, France, assignor to Etablissements Francois Salomon et Fils, Annecy, France

Filed Sep. 2, 1977, Ser. No. 830,243
Claims priority, application France, Sep. 3, 1976, 76 26687
Int. Cl.[2] A63C *9/08*
U.S. Cl. 280—613 **15 Claims**



1. A safety binding for a ski boot, permitting lateral fitting by a rotational movement of the foot upon the ski, comprising

(a) releasable retention means assuring retention of the boot in the longitudinal direction of the ski, said retention means having first locking means secured to the boot and second locking means secured to the ski, each of said first and second locking means being constituted by at least two elements spaced from one another, said elements of one of said locking means being in the form of sockets and said elements of the other said locking means being in the form of rods, at least one of said rods being urged by a resilient element; said rods penetrating in said sockets for locking said boot upon said ski; and

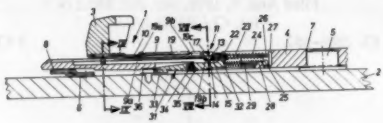
(b) means for pre-positioning the boot upon the ski prior to locking, said means being in the form of complementary profiles associated with the ski and with the boot, respectively, and facilitating the rotational movement of the boot from a position in which the boot is at an angle to the ski; said profile associated with the ski being located between the elements constituting the locking means secured to the ski and said profile associated with the boot being situated between the elements constituting the locking means secured to the boot; said complementary profiles of said prepositioning means being kept in rotatable engagement with each other by a resilient coupling system offering resilient opposition to the separation of said profiles.

4,185,852

SAFETY SKI BINDING

Alois Himmetsberger, Vienna, and Erwin Weigl, Brunn am Gebirge, both of Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Mar. 30, 1978, Ser. No. 891,757
Claims priority, application Austria, Apr. 6, 1977, 2396/77
Int. Cl.[2] A63C *9/08*
U.S. Cl. 280—618 **13 Claims**



1. A safety ski binding for use on a ski, comprising:

an elongated sole plate;

pivot means mounted on said ski for pivotally supporting said sole plate about an axis which is perpendicular to an upper surface of a ski;

ski boot holding jaw means;

support means supporting said ski boot holding jaw means for movement along the longitudinal axis of said sole plate between a first position and a second position;

releasable locking means for releasably locking said ski boot holding jaw means to said sole plate in said first position thereof to facilitate a holding of a ski boot in a downhill skiing position in said ski binding, said releasable locking means comprising a locking part on at least one of said holding jaw means and said sole plate, and a two arm rocking lever pivotally mounted at a location intermediate said two arms on the other of said holding jaw means and said sole plate, one of said two arms engaging said locking part to hold said holding jaw means in said first position on said sole plate, a control member fixed to said upper surface of said ski, the other of said two arms engaging said control member, control surfaces on said control member adapted to become operatively engaged by said other of said two arms in response to a pivoting of said sole plate beyond a predetermined limit to effect a pivoting of said one arm away from said locking part to thereby unlock said holding jaw means from said sole plate and permit said ski boot to urge said holding jaw means toward said second position.

4,185,853

FOLDING NOSEPLATE FOR A HANDTRUCK

Elmer T. Thurmond, Jr., Miami, Fla., assignor to Equipment Company of America, Hialeah, Fla.

Filed Jan. 10, 1978, Ser. No. 868,318
Int. Cl.[2] B62B *1/20*
U.S. Cl. 280—652 **7 Claims**

1. A handtruck including a back frame having an upper

handle portion and an elongated main body portion, a pair of opposed wheels, a pair of opposed, rearwardly extending mounting means for securing said pair of wheels in axially rotatable relationship to the lower portion of said back frame, wherein the improvement comprises,

a folding noseplate pivotally attached to the lower extremity of said back frame,

said noseplate having a folded position when in a folded inward disposition in a plane substantially parallel to said elongated main body portion,

said noseplate having an operable position when in an outward extending disposition in a plane substantially perpendicular to said elongated main body portion,

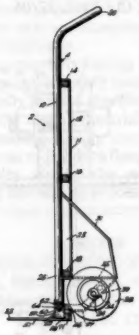
said lower extremity of said back frame comprising a pair of opposing, spaced-apart depending prongs,

a minor portion of said noseplate extending rearwardly of said back frame, in the operable position of the noseplate,

a pair of enlarged base members secured to said noseplate at its opposing rearward corners,

each said enlarged base member having a forward and rearward portion,

each of said forward portions comprising an opposed pair of connector means for pivotal attachment of said noseplate to said depending prongs,



each of said connector means including a pair of spaced-apart, substantially parallel upright arms for receiving said depending prongs,

each of said connector means further including pin means traversing said pair of upright arms and said cooperatively positioned prongs,

each said rearward portion disposed rearwardly of said back frame,

each said rearward portion having an upwardly facing flat surface,

each of said mounting means comprising a loop bracket with opposed bracket end portions secured to said back frame,

the lower said end bracket portion disposed in substantially perpendicular relationship to said back frame,

said lower end bracket portion having a flat surface portion integrally formed on the downwardly facing surface of the same,

whereby pivoting of said noseplate at the point of juncture of the depending prongs and the connector means brings the downwardly facing flat portion formed on the opposed mounting means and the upwardly facing flat portion formed on the rearward portion of the enlarged base member into rotation-stopping alignment.

4,185,854

OSCILLATING DOUBLE AXLE ASSEMBLY

Gérard Brando, 8 rue Edgard Quinet, 42100 Saint-Etienne, Loire, France

Filed Apr. 28, 1977, Ser. No. 791,981
Int. Cl.[2] B60G *11/14*
U.S. Cl. 280—677 **13 Claims**

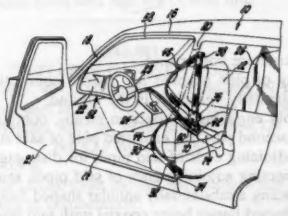
1. An oscillating double axle assembly comprising a bogie chassis including a transverse beam and two longitudinal beams, a central pivot assembly associated with each longitudinal beam and located in alignment with said transverse beam, an arm centrally mounted on each pivot assembly for free pivotal movement, said arm having opposite ends, wheels rotatably mounted at the ends of said arms at equal spacing from said central pivot assembly, and elastic means secured to said arms and to said longitudinal beams for opposing pivotal movement of said arms, said elastic means comprising two stabilization and compensation coil springs for each arm, said coil springs being respectively secured to said arm near said pivot assembly and at remote ends to respective ends of the associated said longitudinal beam in opposition to one another.

4,185,855

PASSIVE SEAT BELT SYSTEM

Theodore M. Salamon, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 15, 1978, Ser. No. 906,090
Int. Cl.[2] B60R *21/10*
U.S. Cl. 280—804 **3 Claims**



1. In a motor vehicle body having an occupant seat mounted within an occupant compartment defined by a roof rail, a windshield pillar and an instrument panel structure, an occupant restraining passive lap and shoulder belt system comprising:

a restraint belt;

first means anchoring one end of the belt on the vehicle body outboard the occupant seat and generally adjacent the hip of the seated occupant;

second means anchoring the other end of the belt on the vehicle body outboard the occupant seat and generally adjacent the shoulder of the seated occupant;

a retracting means associated with one end of the belt for extension and retraction of the belt between a stowed position and an occupant restraining position;

a continuous track means having an outboard end on the roof rail generally adjacent the shoulder of the seated occupant and extending longitudinally along the roof rail, vertically along the windshield pillar, transversely along the instrument panel structure, and longitudinally generally along the vehicle body centerline inboard the seated occupant and having an inboard end located generally adjacent the hip of the seated occupant;

a carriage mounted on the track for movement therealong and slidably receiving the belt to define a lap belt portion between the carriage and first anchor means and a shoulder belt portion between the carriage and the second anchor means;

and power drive means associated with the track for moving the carriage between the outboard end of the track wherein the belt is retracted and stowed outboard the vehicle seat and the inboard end of the track wherein the lap belt portion of the belt extends across the lap of the seated occupant and the shoulder belt portion extends across the chest of the seated occupant.

4,185,856

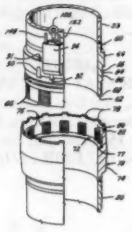
PIPE JOINT WITH REMOTELY OPERABLE LATCH

John W. McCaskill, Houston, Tex., assignor to McEvoy Oilfield Equipment Company, Houston, Tex.

Continuation of Ser. No. 701,080, Jun. 30, 1976, abandoned, which is a continuation of Ser. No. 544,656, Jan. 27, 1975, abandoned, which is a continuation of Ser. No. 350,982, Apr. 13, 1973, abandoned. This application Jul. 24, 1978, Ser. No. 927,369

Int. Cl.[2] F16L *55/00*

U.S. Cl. 285—18 **11 Claims**



1. A structure comprising:

a string of pipe adapted for coaxial connection supported substantially vertically in the ground;

rotatably engaging connection means, composed of a first and second part, for each said pipe of said string mounted on adjoining ends of said pipes for disengageably serially connecting adjoining ends of said pipes, said second part including a substantially annular shaped flange, said annular shaped flange being coaxial with said pipe and extending substantially uniformly radially outward of said pipe, said annular shaped flange having an aperture therein;

engagement members affixed to the first part of said connection means;

a stop member mounted on said second part of said connection means engageable with one of said engagement members, upon connection of said adjoining ends of said pipes;

a latch member housed within said aperture and mechanically engageable and disengageable with said engagement members, said latch member being substantially completely housed within said aperture in the disengaged position;

one of said rotatably engaging connection means being a remote release rotatably engaging connection means for disengageably, remotely, serially connecting adjoining ends of two of said pipes;

remote release means disposed on said remote release rotatably engaging connection means and connected to said latch member of said remote release rotatably engaging connection means for disengaging said latch member of said remote release rotatably engaging connection means from one of said engagement members of said remote release rotatably engaging connection means, the connection between said remote release means and said latch member of said remote release rotatably engaging connection means permitting horizontal and vertical movement of said latch member with respect to said remote release means while said latch member is engaged with said one of said engagement members to prevent transverse loads on said latch member caused by movement of said latch member.

4,185,857

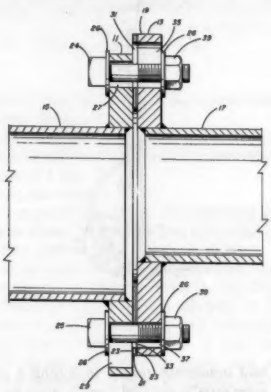
PIPE COUPLING COMPENSATING DEVICE

Raymond F. Saracco, West Mifflin, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jun. 12, 1978, Ser. No. 914,850

Int. Cl.[2] F16L *17/06*

U.S. Cl. 285—363 **1 Claim**



1. A combination to sealably couple pipes and, also, compensate for any relative generally transverse motion between said coupled pipes, which comprise:

a. a first flange adapted to be fixably mounted around said end of one pipe;

b. a second flange adapted to be fixably mounted around said end of another pipe;

c. sealing means for fitting between said flanges; and

d. coupling means, for holding said first and second flanges in parallel axial orientation to one another with said sealing means therebetween, said coupling means to allow said flanges to slidably move parallel to one another and generally transverse to the general axial orientation of said pipes, said coupling means including:

1. a plurality of apertures, generally eliptically shaped having a major and minor axis, placed in said first and second flanges, wherein the eliptically shaped apertures of one half of each of said flanges has a major axis larger than the major axis of the eliptically shaped apertures of the remaining half of said flange;

2. a plurality of bolts passing through said apertures so as

to hold said flanges together so that the half of said first flange with the larger major axis is in registry with the half of said second flange which has the shorter major axis; and

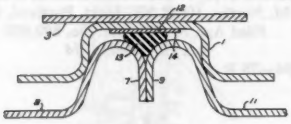
3. a plurality of nuts for said bolts.

4,185,858

SECONDARY SEAL FOR TUBING JOINED VIA V-BAND COUPLINGS

Douglas E. Peash, Enum Claw, Wash., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 28, 1978, Ser. No. 920,867
Int. Cl.² F16L *23/04*
U.S. Cl. 285—367 **2 Claims**



1. In a pneumatic duct system joint having the duct ends to be mated flanged so as to flare and then turn radially inward at their abutting faces forming curved segments between the flare and the abutting faces, and having a V-band coupling engaging the flares of the duct ends and compressing said abutting faces, the improvement comprising:

an annular sealing assembly having a metallic support band with a ductile metallic sealing material bonded thereto and extending radially inward therefrom; and

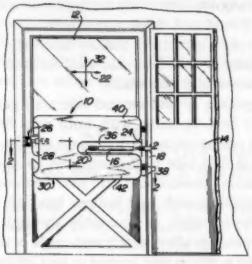
where said metallic sealing material has multiple ridges, on the surfaces making sealing contact with the inwardly curving segments of the duct flanges, which ridges extend circumferentially around the material's periphery and deform during the mating process.

4,185,859

DOOR OPENING SYSTEM

Ralph Cunningham, 508 S. Main St., Mt. Airy, Md. 21771

Filed Mar. 21, 1978, Ser. No. 888,619
Int. Cl.² E05C *15/02*
U.S. Cl. 292—93 **11 Claims**



1. A door opening system for releasably actuating a door latch having a displaceable latch lever and latch handle and rotatably displacing a door in one motion of a user, said door extending in a vertical and transverse direction in a substantially planar contour including an automatic closing device coupled to a jamb of said door and extending in said transverse direction for securement to an inner surface of said door, comprising:

(a) a planar member extending in a transverse direction across said door adjacent and substantially parallel to a plane of said door, said planar member having a vertical extension substantially greater than a vertical extension of said door latch for providing a large planar contact surface between said planar member and a portion of the body of a user; said planar member having a predetermined contour for providing non-interference of said planar member with said automatic closing device; and,

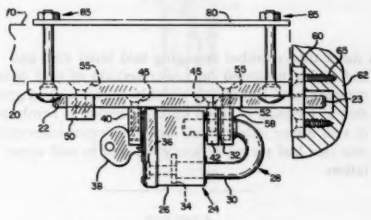
(b) means for actuating said door latch for displacing said latch lever, said actuating means being fixedly secured to said planar member and said latch lever being positionally located in contact relation therewith.

4,185,860

PADLOCK AND BOLT ASSEMBLY

Herman H. Bondi, Portland, Oreg., assignor to Skylawn, Hayward, Calif.

Filed Jan. 18, 1978, Ser. No. 870,271
Int. Cl.² E05C *1/04*
U.S. Cl. 292—148 **4 Claims**



1. A padlock and bolt assembly comprising:

(a) a base plate;

(b) a bolt slideably mounted on said base plate;

(c) a padlock comprising a barrel and a generally U-shaped link having first and second legs, the first leg of said link being slideably disengageable from said barrel and the second leg of said link being pivotally and slideably secured to said barrel;

(d) sleeve bracket means secured to said base plate for slideably receiving said bolt, said sleeve bracket means being secured also to said link; and

(e) a pair of padlock yoke members secured to said bolt for straddling said barrel, one of said yoke members slideably engaging the first leg of said link, said yoke members being oriented with respect to said barrel so as to permit said barrel to be pivoted about said second leg of said link from a position straddled by said yoke members to a position not straddled by said yoke members when said barrel is disengaged from said first leg of said link.

4,185,861

PORTABLE CANINE TOILET

Charles R. Berner, 40-70 Hampton St., Elmhurst, N.Y. 11373

Continuation-in-part of Ser. No. 825,523, Aug. 17, 1977. This application Apr. 10, 1978, Ser. No. 894,727
Int. Cl.² A01K *29/00*
U.S. Cl. 294—19 R **4 Claims**

1. A portable canine toilet having disposable waste receiving bags comprising in combination:

a frame;

a pair of feet for supporting said frame in contact with the ground in a comfortable position until the canine is ready to use it;

a handle for holding said frame in said position and raising it when needed;

telescopic handle member connected to upper section of said frame;

two parallel arms rotatably connected to front section of said frame for holding said disposable bags;

a first container connected to lower rear section of said frame for storing clean bags;

a second container connected to upper rear section of said frame for temporary storage of soiled bags;

an inner rod member connected at its lower end to the upper section of said frame; said inner rod having a linearly disposed groove along its length with indentations at the upper and lower ends of said groove;

an outer tube member engaging said inner rod; and

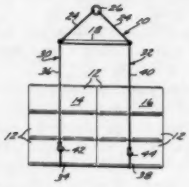
a leaf spring mounted on lower section of said outer tube member, said leaf spring slidably engaging said groove so that in a closed position said leaf spring is firmly indexed in said lower indentation, and in an open telescopic position said leaf spring is firmly indexed in said upper indentation.

4,185,862

SELF-STABILIZING MULTIPLE SLING SYSTEM AND METHOD

Hugo T. Slocombe, 2812 Iroquois Ave., Long Beach, Calif. 90815

Filed Dec. 30, 1977, Ser. No. 865,848
Int. Cl.² B66C *1/18*
U.S. Cl. 294—74 **10 Claims**



1. In combination with a load, an improved self-stabilizing multiple sling system, said load including a first plurality of substantially identical, double-ended cargo items arranged on top of one another with their corresponding ends in general vertical alignment to form a first stack, and a second plurality of said cargo items arranged on top of one another with their corresponding ends in general vertical alignment to form a second stack, each of said cargo items of said first and second stacks being unconnected each with respect to the other and oriented in end-to-end abutment, said sling system comprising:

spreader means including an elongated spreader portion configured to extend across the abutting ends of the cargo items;

hoisting bridle means attached to said spreader means and adapted for attachment to a cargo fall;

a pair of flexible slings for arrangement in loops about said first and second stacks, respectively, whereby each of said loops overlies the bottom and sides of, and forms an apex above, the associated one of said stacks;

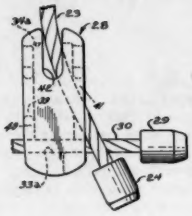
and means coupling the opposite ends of said slings to said spreader portion, said slings being spaced apart a predetermined distance thereby to locate each said sling between the ends of its associated stack whereby lifting forces tend to urge together the ends of at least some of said cargo items in said first stack against the abutting ends of said cargo items of said second stack to stabilize the draft.

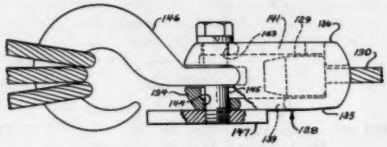
4,185,863

RIGGING FITTING

Dean W. Larson, 1716 NW. 29th St., Portland, Oreg. 97210, and Melvin M. Northe, 10503 NE. Hoyt, Portland, Oreg. 97220

Filed Apr. 3, 1978, Ser. No. 892,950
Int. Cl.² B66C *1/14*
U.S. Cl. 294—78 R **2 Claims**





1. A rigging fitting comprising a relatively rectangular unitary metal body providing first and second end walls and four generally rectangular side walls arranged with first and second side walls opposed and third and fourth side walls opposed, said body having a generally hollow interior,

a first opening in said first side wall located generally midway between said end walls,

a second opening in said second side wall generally aligned with said first opening with both said first and second openings communicating with said hollow interior,

a slot in said first side wall connected to said first opening and extending toward and into said first end wall and also communicating with said hollow interior whereby a ferrule-equipped cable is insertable through said first and second openings after which said cable is slidable through said slot to position said ferrule in said interior against said first end wall,

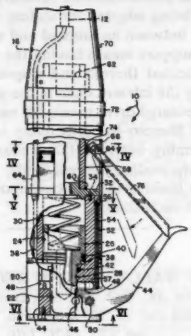
aligned third and fourth openings in said first and second side walls, respectively, communicating with said hollow interior and spaced toward said second end wall from said first and second openings, and

an elongated slot in said second end wall extending into said both said third and fourth side walls and spaced from said first and second side walls to provide an interior seat on said second end wall whereby said elongated slot is adapted to receive either a cable for double end cable usage or a hook for carriage hook usage.

4,185,864
REMOTELY CONTROLLED CYCLIC GRAPNEL HOOK APPARATUS

Lawrence M. Phillips, Olivenhain, Calif., and Marc A. Morinaga, Honolulu, Hi., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 23, 1977, Ser. No. 780,371
Int. Cl.[2] B66C *1/38*
U.S. Cl. 294—83 R **9 Claims**



1. A remotely controlled cyclic grapnel hook apparatus comprising:

a cylinder which has a top and a bottom;

said cylinder having a central bore axially therethrough and a counterbore in its top portion;

a piston having a top and a bottom;

a piston rod centrally connected to the bottom of the piston;

said piston being slidably mounted in the cylinder counterbore and the piston rod being slidably mounted in the cylinder bore therebelow;

means for downwardly biasing the piston and piston rod;

the cylinder having a passageway to the bottom of the counterbore so that fluid pressure can be applied or released therein for moving the piston and piston rod up or down in the cylinder against the force of the spring means;

at least one hook pivoted to the bottom of the cylinder so as to extend outwardly therefrom; and

said hook having a camming surface which engages the side of the piston rod so that the hook is locked in an upward load carrying position when the piston rod is in a downward position and is free to pivot downwardly to a load releasing position when the piston rod is moved upwardly.

4,185,865
RELEASABLE WIRELINE OVERSHOT

William T. Taylor, P.O. Box 309 (Rte. 2, Box 291A), Warren, Tex. 77664

Continuation of Ser. No. 583,773, Jun. 4, 1975. This application Mar. 16, 1978, Ser. No. 887,347
Int. Cl.[2] E21B *31/02*
U.S. Cl. 294—86.3 **11 Claims**

1. An overshot operable on a wire line, comprising:

(a) an overshot body;

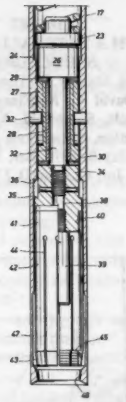
(b) a first means carried on said body, said first means functioning as a cam follower;

(c) an elongate set of collet fingers mounted with a bumper portion supported by said body and arranged in a circular fashion to engage a fish in a well, said fingers flexing to accommodate variations in the size of the fish;

(d) a tapered surface supported by said body adjacent said collet fingers, said tapered surface movable axially relative to said collet fingers which axial movement deflects said collet fingers between fish engaging and disengaging positions;

(e) means for axially urging said collet fingers into fish engaging position; and

(f) cam means operably connected to said collet fingers, said cam means defining a serious of inclined surfaces, said cam means engaging said first means, whereby initial relative axial movement of said first means and said cam means operates to rotate said cam means in a single direction

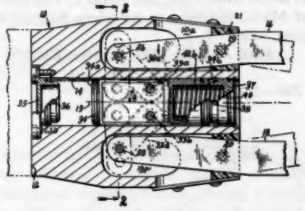


relative to said first means, which rotational movement causes said cam means to engage said first means to shift said first means axially relative to said body, which relative axial movement deflects said collet fingers between fish engaging and disengaging positions, such action being effected by repeated axial impacts applied to said bumper portion by said fish against the action of said urging device, to shift said overshot between fish engaging and disengaging positions upon each successive axial impact.

4,185,866
EXTERNAL-INTERNAL GRIPPER

Christoph F. Wittwer, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jun. 21, 1978, Ser. No. 917,739
Int. Cl.[2] B66C *3/16*
U.S. Cl. 294—88 **11 Claims**



1. An apparatus for grasping objects, comprising:

(a) a gripper housing having an enclosed internal way system;

(b) a pair of fingers pivotally supported in said housing, each of the fingers being on opposite sides of the way system with respect to the other;

(c) an actuator block slidably fitted into said way system for axial movement therethrough, said block having two axial end portions adapted to receive an actuator input force;

(d) a mechanical linkage pivotally connecting a portion of the actuator block disposed between said axial end portions to a portion of each of said fingers offset from the finger pivot for applying a gripper input force to each finger as the actuator block undergoes axial movement; and

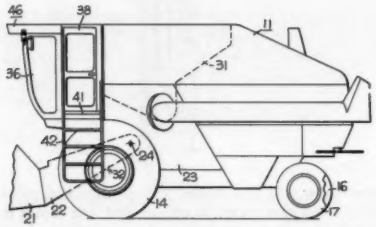
(e) means for selectively applying a compressive actuator input force to the axial end portions of the actuator block to slide said block in said way system.

4,185,867

HARVESTER WITH A LATERALLY EXTENDING VISOR STRUCTURE

William M. Schmidt; Stanley E. Thorwaldsen, both of Grosse Pointe, Mich.; David C. McElroy, Pasadena, Calif., and Stephen G. Miggels, Southfield, Mich., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed May 8, 1978, Ser. No. 903,693
Int. Cl.[2] B62D *27/02*
U.S. Cl. 296—187 **17 Claims**



1. In a self-propelled harvester having a pair of laterally spaced front wheels and a pair of steerable rear wheels,

a grain tank disposed crosswise of said harvester generally rearwardly of and above the axis of the front wheels,

a cab disposed in front of and adjacent to said grain tank, said cab being disposed laterally in an intermediate position between said pair of front wheels, and

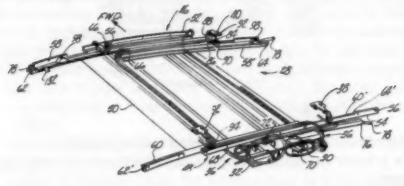
a visor structure rigidly secured to said cab including a pair of horizontally extending parts extending laterally outwardly from the roof portion of said cab to substantially the lateral sides, respectively, of said grain tank.

4,185,868

ELECTRICALLY OPERATED HATCH ROOFS

Milton C. Kaltz, Allen Park, and Heinz C. Prechter, Grosse Ile, both of Mich., assignors to American Sunroof Corporation, Southgate, Mich.

Filed Aug. 22, 1977, Ser. No. 826,370
Int. Cl.[2] B60J *7/10*
U.S. Cl. 296—137 B **9 Claims**



1. In a vehicle having a pair of opposed roof openings formed laterally from a central roof support section, a sliding roof assembly therefor, comprising:

(a) a frame assembly, comprising:

(1) a pair of opposed upstanding side walls secured to the vehicle,

(2) first and second channels formed in each side wall, one channel being vertically and laterally displaced from the other channel, a portion of one channel overlying the other channel, the first channel of each side wall defining a first track and the second channel of each side wall cooperating to define a second track,

(b) first and second viewing panel assemblies, the first assembly being adapted for sliding movement in the first track between an inboard and an outboard position, the second assembly being adapted for sliding movement in the second track between an inboard and an outboard position,

(c) slidable support means having the viewing panel assemblies connected thereto and disposed in the tracks for supporting the inboard ends of the glass panel assemblies,

(d) power-operated drive means for each support means and connected thereto for selectively sliding the associated panel assembly between the inboard and positions and position intermediate thereof, and

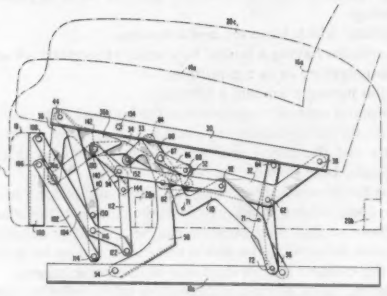
(e) means for limiting the outboard movement of each panel disposed in each track.

4,185,869

TWO-WAY WALL-AVOIDING RECLINER CHAIR

Walter C. Rogers, Jr., P.O. Box 685, Denton, N.C. 27239

Filed Jul. 13, 1977, Ser. No. 815,293
Int. Cl.[2] A47C *1/02*
U.S. Cl. 297—84 **22 Claims**



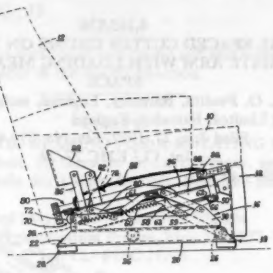
1. A two-way wall-avoiding recliner chair comprising in combination, a base, a seat and backrest interconnected to move as a unit at all times, a seat linkage including a first link (30) fixed to the seat, a mounting linkage mounting the seat linkage to the base for movement between a normal position in which the backrest is generally upright and a first reclined position in which the seat has advanced forwardly of the base from said normal position, said mounting linkage including a main mounting link (50) pivotally connected to said seat linkage and said base, armrests located on opposite sides of the seat, an armrest linkage mounting the armrests to the seat linkage for movement relative to the base, actuating linkage interconnecting the armrest linkage and said main mounting link of the mounting linkage for moving the mounting linkage and in turn the seat linkage to move the seat from said normal position to said first reclined position thereof in response to movement of said armrests forwardly relative to the base and seat, a footrest, footrest linkage mounting the footrest to the seat linkage for movement between a retracted position adjacent the front of the seat and an extended position projected forwardly from the seat, and a transmission means including a transmission link (90) interconnecting the armrest linkage and the footrest linkage for moving the footrest from said retracted position to said extended position thereof when the armrests are moved forwardly relative to the base and seat to move the seat from said normal position to said reclined position.

4,185,870

SEAT-OPERATED INTERLOCK

Carl B. Johnson, Pontiac, Ill., assignor to Pontiac Furniture Industries, Inc., Pontiac, Ill.

Filed Mar. 13, 1978, Ser. No. 885,587
Int. Cl.[2] A47C *1/02*
U.S. Cl. 297—84 **7 Claims**



1. In a chair which includes a resiliently deflectable seat and provides for relative movement between the seat and another component of the chair under the control of the occupant,

the improvement comprising a latch member mounted on said chair for movement between an effective position at which it prevents said relative movement and an ineffective position at which it permits said relative movement,

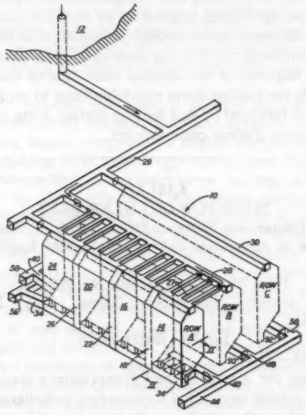
said latch member being biased toward said effective position and being disposed for forceable movement to said ineffective position by the deflection of the seat under the weight of the occupant, thereby to permit said relative movement only when the chair is occupied.

4,185,871

IN-SITU RETORTING SYSTEM

Rudolph Kvapil, Denver, and K. Malcolm Clews, Littleton, both of Colo., assignors to Gulf Oil and Standard Oil, both of Pittsburgh, Pa.

Filed May 23, 1978, Ser. No. 908,795
Int. Cl.[2] E21C *41/10*
U.S. Cl. 299—2 **17 Claims**



12. A system for the recovery of fluid products from a subsurface carbonaceous deposit by in-situ combustion of a portion of the carbonaceous material in the deposit comprising a plurality of rubblized retorts having substantially vertical sides, said retorts being arranged in a row and separated from one another by end pillars, an outlet at the lower end of each of the retorts, an exhaust tunnel extending longitudinally of the row of retorts below the retorts within an extension of the sides thereof and laterally displaced from the outlets of the retorts, a cross drift from the outlet of each of the retorts to the exhaust tunnel, means for injecting combustion air into the upper end of each of the retorts, and means communicating with the exhaust tunnel for delivery of the products from the retort to the surface.

4,185,872

IN-SITU LEACHING OF URANIUM

Edward T. Habib, Jr., Richardson, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 18, 1978, Ser. No. 934,933
Int. Cl.[2] E21B *43/28*
U.S. Cl. 299—4 **11 Claims**

1. In the recovery of uranium from a subterranean uranium-containing deposit penetrated by injection and production systems, the method comprising:

(a) introducing into said deposit via said injection system an aqueous lixiviant having a pH of at least 6.0 and containing a leaching agent comprised predominantly of an alkali metal sulfate,

(b) displacing said lixiviant through said subterranean deposit to solubilize uranium therein,

(c) producing pregnant lixiviant containing uranium from said production system, and

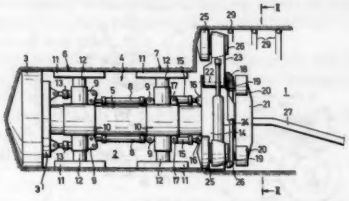
(d) treating said pregnant lixiviant to recover uranium therefrom.

4,185,873

MACHINE FOR MECHANICALLY ADVANCING CLEAN CUT UNDERGROUND MINING GALLERIES OF VARIOUS PROFILES

Karlheinz Bohnes, Bochum, and Kuno Guse, Dortmund, both of Fed. Rep. of Germany, assignors to Bochumer Eisenhutte Heintzmann GmbH & Co., Bochum, Fed. Rep. of Germany

Filed Jun. 6, 1978, Ser. No. 913,082
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1977, 2726445
Int. Cl.[2] E21D *9/10*
U.S. Cl. 299—31 **27 Claims**



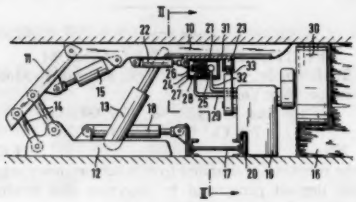
1. In a machine for mechanically advancing clean-cut underground mining galleries of various profiles, a combination comprising elongated support means having a longitudinal axis, a front end and a rear end; full-cut tools carried by said front end of said support means for cutting a pilot excavation of circular cross-section smaller than the desired final cross-section of the mining gallery; a rotatable carrier body having an axis of rotation parallel to said longitudinal axis; clean-cut tools carried at said rear end of said support means for widening said pilot excavation to the desired cross-section of the mining gallery, said clean-cutting tools being operatively connected to said carrier body adjustable in radial direction of the latter; and means on said support means for bracing and for advancing said support means in said pilot excavation.

4,185,874

LONGWALL INSTALLATION WITH CARRIER FOR WATER AND ELECTRIC SUPPLY AND PROPULSION ROCK

Klaus Beckmann, Lunen, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Jul. 24, 1978, Ser. No. 927,204
Int. Cl.[2] E21C *27/36*
U.S. Cl. 299—32 18 Claims



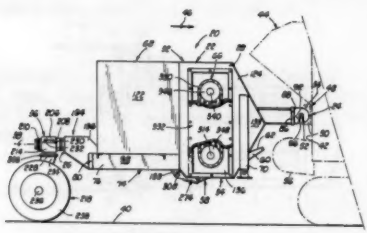
1. In a mineral mining installation comprising a conveyor disposed alongside a mineral face and a mineral winning machine movable in relation to the conveyor to win mineral from the mineral face; the improvement comprising: a constructional assembly independent of and separate from the conveyor, the constructional assembly composed of displaceable carrier means, water supply means for the winning machine mounted on the carrier means, electric supply means for the winning machine mounted on the carrier means, a propulsion track mounted on the carrier means, and a driven components of drive means of the winning machine mounted on the machine and co-operably engaged with the propulsion track.

4,185,875

ASPHALT CRUSHING APPARATUS

George W. Swisher, Jr., and Thomas L. Steele, both of Oklahoma City, Okla., assignors to CMI Corporation, Oklahoma City, Okla.

Filed Oct. 4, 1978, Ser. No. 948,389
Int. Cl.[2] E01C *23/08*
U.S. Cl. 299—39 10 Claims



1. In combination with a roadway planer producing fragments of asphalt from a paved roadway and discharging the fragments from the rear end thereof a distance above the roadway:

a chassis connected to the rear end of the roadway planer;

wheel means supporting the chassis rearwardly of the planer; and

crushing means carried by the chassis for receiving the fragments of asphalt from the roadway planer and reducing the size of the fragments exceeding a predetermined dimension, comprising:

a grid comprising a plurality of substantially parallel, spaced apart bars positioned to receive the fragments of asphalt thereon, the distance between the bars being substantially equal to said predetermined dimension;

a plurality of cutting bits sized to move between the bars; and

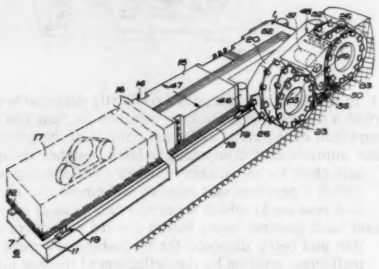
means for repetitively moving the cutting bits between the bars for reducing the size of the fragments exceeding said predetermined dimension.

4,185,876

PLURAL SPACED CUTTER DRUMS ON PIVOTABLE ELONGATE ARM WITH LOADING MEANS IN THE SPACE

Gerald R. O. Pentith, Barnsley, England, assignor to Summit Mining Limited, Barnsley, England

Filed Jun. 27, 1977, Ser. No. 810,420
Int. Cl.[2] E21C *27/24*
U.S. Cl. 299—45 9 Claims



1. A shearer type mining machine including a gearhead, which gearhead comprises an elongate arm pivotally attachable at or about its mid-position to one end of said shearer type mining machine, to provide an arm pivot axis extending laterally with respect to the longitudinal axis of the arm, a spiral vane cutting drum carried proximate each arm end, the adjacent drum peripheries being spaced apart to define a nip, a mineral loading means located in said nip, and said drums being rotatable about axes parallel to said arm pivot axis and being contra-rotatable, said vane or vanes of one of said drums being of opposite hand to said vane or vanes of the other of said drums means for pivoting said elongate arm to a position such that the leading cutting drum is in an elevated position with respect to the other lower trailing cutting drum in either direction of movement, so that the leading cutting drum will remove the majority of the mineral seam cutting from roof to floor, while the trailing drum cuts from floor to roof, whereby the minerals removed by said leading cutting drum will not fall onto the lower trailing cutting drum.

4,185,877

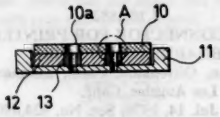
SHOE FOR CRAWLER BELT

Takakiyo Tanoue, and Noriyuki Itakura, both of Akashi, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 12, 1978, Ser. No. 905,448
Claims priority, application Japan, May 27, 1977, 52/68187[U]
Int. Cl.[2] B62D *55/26*
U.S. Cl. 305—35 R 6 Claims

1. A shoe for a crawler belt comprising a tray-like plate defining a central cavity and surrounding peripheral walls, an elastic member substantially conforming to and located within said cavity, a plurality of bushes fixedly secured within said elastic members and fastening means extending through said bushes to detachably secure said elastic members to said tray-like plate, and a rigid tread plate conforming to and bonded to

the surface of said elastic member, said elastic member and said walls being relatively dimensioned so that said rigid tread plate



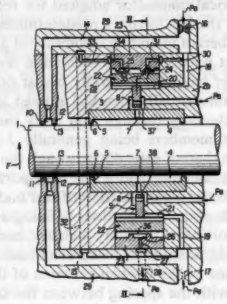
extends at least in part out of said cavity and said walls support said elastic member in the lateral direction.

4,185,878

HYDROSTATIC BEARING FOR A ROTATING SHAFT

Bernard L. Robert, St. Germain en Laye, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed May 11, 1978, Ser. No. 904,894
Claims priority, application France, May 13, 1977, 77 14746
Int. Cl.[2] F16C *17/16*
U.S. Cl. 308—9 **4 Claims**



1. Hydrostatic bearing for a rotating shaft comprising:

a support circuit including opposed support chambers adapted for positioning around said shaft for receiving fluid under pressure from fluid supply passages and having a permanent leakage play with respect to said shaft,

a circuit for detection of the radial position of said shaft in said bearing including opposed detection chambers positioned around said shaft for receiving fluid under pressure and having a permanent leakage play with respect to said shaft,

means for servoing said shaft in position actuated by said detection circuit and acting on said support circuit, said servoing means comprising a mobile distributor element for supplying fluid to said opposed support chambers by the intermediary of constrictions varying in opposite senses on either side of an equilibrium position of said distributor element, said mobile distributor element being integral in movement with a mobile corrector element subjected to the opposed damping actions of the fluid pressure in said opposed chambers of said detection circuit, wherein said mobile distributor element is in the form of an annular element surrounding said fluid supply passages to said support chambers and forming with said passages said constrictions, said annular element being in addition subjected, at opposed zones of its periphery with angular positions corresponding to that of said detection chambers, to the pressures of the fluid prevailing in said detection chambers; and

a fluid balancing circuit for the normal position of said shaft in said bearing, wherein:

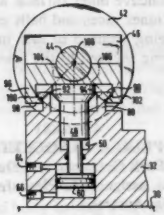
said mobile annular distributor element is surrounded by a second annular element constituting said mobile corrector element and forming therewith chambers connected with said detection chambers and delimiting the opposed zones, said second annular element being subjected at its periphery, and in the same angular orientation as that of said detection chambers, to the opposed action of fluid-throttling pressures which correspond, on the one hand, to detection circuit leaks and, on the other, to a leak of said fluid balancing circuit for the normal position of said shaft in said bearing.

4,185,879

SHAFT-SUPPORTING MEANS, ESPECIALLY FOR PRINTING APPARATUS

Christoph Hars; Klaus Schirrich; Bodo Steinmeier, all of Bielefeld, and Wilfried Tappe, Herford, all of Fed. Rep. of Germany, assignors to Fischer & Krecke, Bielefeld, Fed. Rep. of Germany

Filed May 30, 1978, Ser. No. 911,005
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1977, 2725033
Int. Cl.[2] F16C *13/00*
U.S. Cl. 308—20 **14 Claims**



1. Means for supporting a shaft having a central axis and subjected to radial impact forces and carrying a member slightly adjustable in a radial direction of said shaft between a working position and a rest position, comprising:

(a) bearings for supporting said shaft;

(b) a fixedly arranged bearing block having a bore therein;

(c) a guide bolt axially displaceable in said bore of said bearing block;

(d) two bearing jewels each comprising a said bearing and guided in said bore with the aid of said guide bolt;

(e) two support surfaces for said bearing jewels inclined with respect to a plane perpendicular to the direction of adjustment of said shaft;

(f) corresponding second support surfaces on said bearing block against which said first support surfaces are pressed when said shaft is in working position;

(g) said central axis of said shaft being disposed within the smaller of the angles formed by said support surfaces of a said bearing jewel.

4,185,880

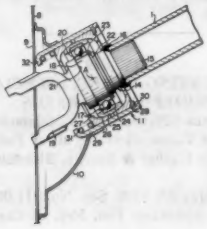
STRUCTURE FOR SUPPORTING A STEERING COLUMN MAIN SHAFT

Masanao Shiomi, and Shigetoshi Miyoshi, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 7, 1978, Ser. No. 922,771
Claims priority, application Japan, Jan. 30, 1978, 53/9094
Int. Cl.[2] F16C *23/08, 25/08*
U.S. Cl. 308—189 R **2 Claims**

1. A structure for supporting a steering main shaft comprising first and second bearing structures which rotatably support upper and lower end portions of said shaft, respectively, said second bearing structure permitting pivotal movement of said steering main shaft about a point on the axis of said shaft with three degrees of freedom, said second bearing structure com-

prising a housing, an outer ring element movably disposed in said housing for movement along the axis of said shaft relative to said housing and having a spherically concave inner surface, a spring disposed between said housing and said outer ring element for biasing said outer ring element relative to said housing along the axis of said shaft in a direction toward said



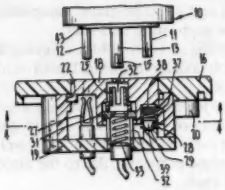
upper end, an inner ring element having a spherically convex outer surface which is complementary to and is received by said spherically concave inner surface, and ball bearing means having outer and inner races and balls engaged therebetween, said outer race being secured to said inner ring element and said inner race being secured to the lower end portion of said shaft.

4,185,881

ELECTRICAL PLUG AND SOCKET ARRANGEMENT

Jeffery R. Foley, Park Orchards, and Daryl J. Foley, Ivanhoe, both of Australia, assignors to Playsafe Electrics Proprietary Limited, Victoria, Australia

Filed Jul. 19, 1978, Ser. No. 926,015
Int. Cl.[2] H01R *13/44*
U.S. Cl. 339—41 **6 Claims**



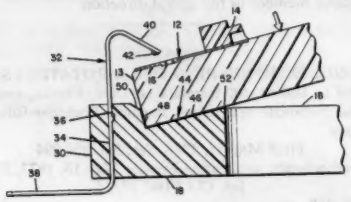
1. An electrical plug and socket arrangement including a body part of the socket, a pin receiving member having a plurality of pin receptacles and being mounted in said body part for limited rotational movement with respect to said body part, said pin receptacles providing openings in a front face of said socket and each being adapted to receive a respective pin of said plug, one of said receptacles being an active pin receptacle which, in a first position of said member relative to said body is, in use, electrically inactive, and in a second position of said member relative to said body is, in use, electrically active so as to electrically energise a said pin inserted therein, one of said pins being an earth pin which is located along the axis of rotation of said member and said movement of said member from said first position to said second position being possible only by insertion of said earth pin fully into its respective receptacle thereby necessitating full insertion of said plug into said socket, insertion and withdrawal of said plug to and from said position of full insertion being possible only in said first position of said member, and said earth pin being a special pin having a unique key configuration so as to co-operate with its respective receptacle to enable said movement only when in a fully inserted position therein, said co-operation also serving to retain said earth pin in said fully inserted position except when said member is in said first position.

4,185,882

ELECTRICAL CONNECTOR FOR PRINTED CIRCUIT BOARDS OR THE LIKE

Donald L. Johnson, Olivenhain, Calif., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Jul. 14, 1978, Ser. No. 924,690
Int. Cl.[2] H01R *13/62*
U.S. Cl. 339—176 MP **9 Claims**



1. In an electrical connector adapted for receiving printed circuit boards or the like having a predetermined thickness and having an edge thereof including a plurality of generally planar electrical contact portions, the combination comprising:

a body member having a generally planar portion;

a plurality of substantially identical aligned resilient contact members extending through said body member, each of said contact members being generally J-shaped with a stem portion thereof extending through the planar portion of said body member and a free end portion projecting back towards the planar portion of said body member, the terminal ends of the end portions defining a line parallel to the planar portion of the body member, each of the terminal ends being adapted to make electrical contact with a respective one of the contact portions of the printed circuit board, with the spacing between the defined parallel line and the planar portion of the body member defining an opening to receive the edge of the printed circuit board, the opening having a smaller dimension than the thickness of the printed circuit board;

a recess formed in said planar portion below said line, said recess having sufficient depth and being configured for receiving said edge with the board thereof angularly disposed relative to said planar portion with said edge in non-touching relation relative to the terminal ends of said contact members, pivoting of said board toward said planar portion bringing the electrical contact portions of said edge into abutting relation with the terminal ends of said contact members; and

a ridge portion of said body member adjacent said recess, said ridge portion being so positioned that movement of the edge of said board into said opening retains at least a portion of said edge on said ridge portion with said board in abutting relation with the planar portion said body member.

4,185,883

OPTICAL FIBER COUPLING ELEMENT

Martin Chown, Harlow, and John S. Leach, Bishops Stortford, both of England, assignors to ITT Industries, Inc., New York, N.Y.

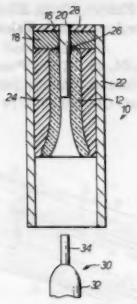
Filed Mar. 24, 1978, Ser. No. 889,968
Claims priority, application United Kingdom, Apr. 5, 1977, 14326/77
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.20 **6 Claims**

1. An optical fiber coupling element comprising:

a ferrule having a front mating end and a rear optical fiber termination end;

a sleeve of a glass-like material axially mounted in said ferrule, said sleeve having front and rear ends;

a short length of optical fiber mounted in said sleeve with one end of said fiber projecting forwardly from said front end of said sleeve but the other end of said fiber being short of said rear end of said sleeve;



said projecting end of said short length of fiber terminating closely adjacent to said front mating end of said ferrule;

said sleeve being collapsed onto said fiber to fixedly retain said fiber therein; and

the portion of said sleeve adjacent to said rear end thereof being shaped to provide a socket for receiving therein the end of a second optical fiber.

4,185,884

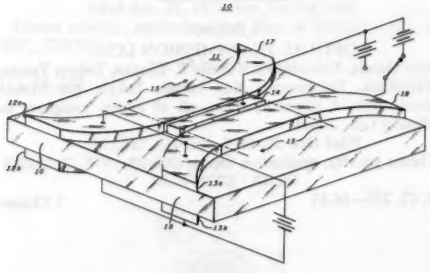
FOUR PORT OPTICAL INTERNAL REFLECTANCE SWITCHABLE COUPLER

Donald H. McMahon, Carlisle, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Dec. 20, 1977, Ser. No. 862,456

Int. Cl.² G02B 5/14

U.S. Cl. 350—96.14 **3 Claims**



1. An optical coupling apparatus comprising:

a substrate of electro-optic material having first and second major surfaces and a refractive index n_1;

first and second means for increasing said refractive index n_1 to a refractive index n_2 to form first and second optical channels in said substrate;

said first and second optical guiding channels extending in parallel relationship for a predetermined length with a predetermined separation therebetween to establish a coupling region wherein a refractive index n_3 in the order of $(n_2-n_1)/2$ is realized by ion diffusion; and

electrode means positioned on said first and second major surfaces of said substrate within the projected area of said coupling region for applying a voltage across said substrate, the application of said voltage with a predetermined polarity causing a refractive index increase with respect to said refractive index n_3, and the application of said voltage with a polarity opposite said predetermined polarity causing a refractive index decrease with respect to said refractive index n_3.

4,185,885

OPTICAL FIBER CONNECTOR

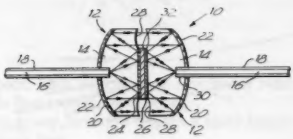
Martin Chown, and Melvin M. Ramsay, both of Harlow, England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jul. 31, 1978, Ser. No. 929,792

Claims priority, application United Kingdom, Aug. 2, 1977, 32359/77

Int. Cl.² G02B 5/14

U.S. Cl. 350—96.18 **10 Claims**



1. A connector for optical fibers comprising:

a matched pair of coupling elements each comprising a cylindrical body of transparent material having a refractive index substantially the same as that of the fibers to be connected;

the cylindrical body of each said element having on one end face a concave reflector, concentric with the body, said reflector facing into said body;

the other end of said body having a circular reflector facing said concave reflector;

said circular reflector having a diameter less than that of said cylindrical body and being concentric therewith;

said concave reflector having at its center an aperture equal in diameter to the diameter of the fiber to be connected;

means for optically coupling the end of an optical fiber to the transparent element via said aperture in the concave reflector; and

said coupling elements being arranged in mutual alignment with said concave reflectors facing each other.

4,185,886

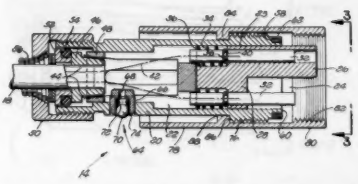
FIBER OPTIC CONNECTOR

Patrick G. Corrales, Garden Grove, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 26, 1978, Ser. No. 955,179

Int. Cl.² G02B 5/14

U.S. Cl. 350—96.21 **11 Claims**



1. A fiber optic connector member comprising:

a shell containing a fiber optic ferrule;

an opening in the wall of the said shell communicating with the interior of said shell, said interior being adapted to be filled with an index matching liquid;

valve means in said opening;

coupling means on said shell movable between forward and rear positions on said shell;

in said forward position said coupling means being adapted to couple to a mating connector member and exposing said valve means and;

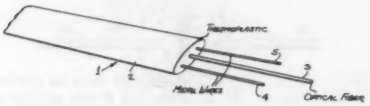
in said rear position said coupling means opening said valve means to vent said interior to atmosphere.

4,185,887

OPTICAL FIBER CABLE

Antonio Ferrentino, Monza, Italy, assignor to Industrie Pirelli Societa per Azioni, Milan, Italy

Filed May 10, 1974, Ser. No. 468,765
Claims priority, application Italy, Jun. 1, 1973, 24925 A/73
Int. Cl.[2] G02B 5/16
U.S. Cl. 350—96.23 **16 Claims**



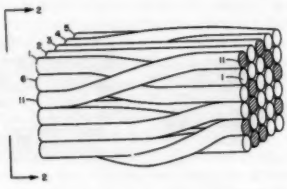
1. A composite optical fiber band which is wide relative to its thickness and which has surfaces defining its thickness which will provide a generally flat band, said band comprising at least one, light transmitting fiber and a plurality of metal wires embedded in a band of a synthetic thermoplastic resin and in contact with said resin, said fiber and said wires having diameters of substantially the same order and temperature coefficients of linear expansion of substantially the same order, said wires being disposed on opposite sides of each said fiber to povide a single optical fiber between pairs of wires and said wires being spaced and separated from each said fiber by substantially equal distances and said wires also being spaced and separated from each other with portions of said resin of said band intermediate said wires and intermediate and in contact with said wires and said fiber whereby relative movement between said wires and said fiber is resisted by the contact of the resin therewith and said wires cause the stresses to which said fiber would be subjected when the band is subjected to tension and bending within the elastic limits of the band to be only slight.

4,185,888

CRYPTOGRAPHIC SYSTEM EMPLOYING OPTICAL SCRAMBLING ARRAYS

Fred W. Quelle, Jr., 8 Garden Ct., Cambridge, Mass. 02138

Filed Sep. 21, 1962, Ser. No. 225,402
Int. Cl.[2] G02B 5/16; G09C 1/00
U.S. Cl. 350—96.25 **11 Claims**



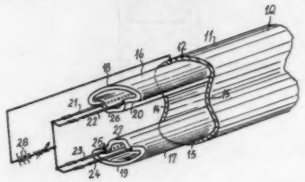
1. A system for coding optical images comprising, in combination, first and second geometric arrays of light-conducting elements, similar elements of each array being scrambled in a random fashion such that the respective ends of these conductors occupy different relative positions at both ends of the array, said arrays being coupled end to end, and means for varying the position of one of said arrays with respect to the other whereby an image passing through said arrays is subjected to different coding in each of said arrays.

4,185,889

TEMPERATURE GRADIENT LIGHT WAVEGUIDE

Georges R. P. Marie, Fontenay-aux-Roses; Jacques Allanic, Sceaux, and Yves J. Peltier, Paris, all of France, assignors to Etat Francais Societe Anonyme de Telecommunication, Paris, France

Filed Jul. 24, 1978, Ser. No. 927,332
Claims priority, application France, Jul. 27, 1978, 77 23054
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.32 **6 Claims**



1. A guide for light or infrared wave beam having a temperature gradient in a gas, said guide comprising:

an isothermic metal sheath filled with gas, having a helical shape in the axial direction and a cross-section having two diametrically opposite convex parts and two diametrically opposite concave parts forming a constriction;

four conductive heater wires symmetrically located inside said sheath in pairs with respect to the center of symmetry of the sheath; and

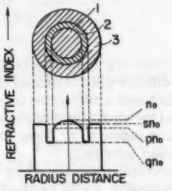
two insulating cylindrical holders inside said sheath, each bearing two of said conductive heater wires and having the shape of a plane convex segment in cross-section, the convex parts of the segments being in the convex parts of the sheath and held in position by the constriction in the sheath.

4,185,890

OPTICAL TRANSMISSION LINE

Seiichi Onoda, Tokorozawa; Toshiki P. Tanaka, Tokyo; Tsuneo Suganuma, Tokorozawa; Koji Ishida, Tokyo, and Masao Sumi, both of Higashi-yamato, all of Japan, assignors to Hitachi Ltd., Japan

Filed Oct. 20, 1976, Ser. No. 734,310
Claims priority, application Japan, Oct. 20, 1975, 50-125318
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.33 **7 Claims**



1. An optical transmission line composed of an optical fiber, comprising:

(a) a core layer whose refractive index decreases continuously in the radial direction from its center,

(b) a cladding layer which has a uniform refractive index being substantially equal to a lowest refractive index of said core layer, and

(c) an intermediate layer which intervenes between said core

layer and said cladding layer and which has a uniform refractive index being lower than said lowest refractive index of said core layer,

(d) the three layers being concentrically arranged.

4,185,891

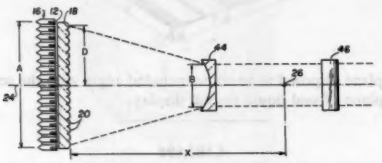
LASER DIODE COLLIMATION OPTICS

Paul Kaestner, Huntington, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Nov. 30, 1977, Ser. No. 856,014

Int. Cl.² G02B *27/30*; H01S *3/23*

U.S. Cl. 350—167 **21 Claims**



13. A method of providing a useful output from a plurality of light sources, said method comprising the steps of:

stacking the sources of light in a predetermined array;

focusing light emissions from each of the sources through an individually dedicated focusing lens toward a single common point on a central optical axis, and

collimating the light emissions from each of the sources before said emissions reach said single common point to provide a more intense beam at distances from the sources due to negligible divergence after collimating.

4,185,892

APPARATUS FOR THE ADJUSTMENT OF TWO INTERSECTING OPTICAL AXES

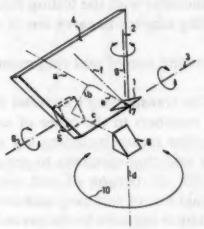
Friedrich Aurin, Heidenheim-Schnaitheim, Fed. Rep. of Germany, assignor to Carl Zeiss Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Jun. 21, 1978, Ser. No. 917,468

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1977, 2728730

Int. Cl.² G02B *27/14*

U.S. Cl. 350—171 **9 Claims**



1. Adjustable optical apparatus comprising a first optical system including a first optical beam deflection element mounted for rotation about a first axis of rotation and also mounted for rotation about a second axis of rotation extending at a substantial angle to said first axis, a second optical system including a second optical beam deflection element mounted for rotation about said first axis and also mounted for rotation about a third axis of rotation spaced from said second axis and extending at a substantial angle to said first axis, and reflecting means for producing an image of the beam deflection element of one optical system at a locus of the beam deflection element of the other optical system in all adjusted positions of said optical systems about their axes of rotation.

4,185,893

ZOOM LENSES

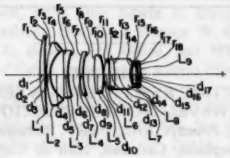
Ryota Ogawa; Sadao Okudaira, both of Saitama; Takayuki Itoh, Tokyo, and Satoru Tachihara, Saitama, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1978, Ser. No. 913,274

Claims priority, application Japan, Jun. 10, 1977, 52-68698

Int. Cl.² G02B *15/14*

U.S. Cl. 350—184 **5 Claims**



1. A compact, high performance low zoom ratio variable viewing angle lens system, comprising:

a front lens group having a negative focal length f_1 and a final convex lens;

a rear lens group having a positive focal length f_2;

an aerial space of distance l between said front and rear lens groups in which the luminous flux is greatly divergent;

the incidental covering angle being variable by varying the aerial space l, said lens system satisfying the following conditions:

$$0.7 \leqq \frac{f_2}{f_{min}} \leqq 1.3$$

$$0.1 \leqq \frac{l_{max}}{f_{min}} \leqq 0.7$$

where l_{max} is the maximum value of the aerial space l, f_{min} is the overall focal length at $l=l_{max}$, said lens system further having a back focal length of 0.8 Lϕ or more and a minimum value of the overall lens length including the back focal length of 2.3 Lϕ or less, where Lϕ is the length of the diagonal of the image frame, said lens system defined by the followings:

Lens	f = 26.0–31.0		view angle 2ω = 81.2°–70.8°		
L_i	j,k	r	d	n	ν
L_1	1	91.9	2.54	1.51823	59.0
	2	1069.190	0.10		
L_2	3	42.130	1.37	1.80400	46.6
	4	13.703	6.45		
L_3	5	465.000	1.49	1.67790	50.7
	6	28.750	5.19		
L_4	7	23.270	1.82	1.78470	26.2
	8	34.700	5.02–1.669		
L_5	9	56.700	4.19	1.80610	40.9
	10	−59.400	0.10		
L_6	11	18.093	2.31	1.80610	40.9
	12	56.517	2.37		
L_7	13	−64.907	7.24	1.84666	23.9
	14	16.331	1.12		

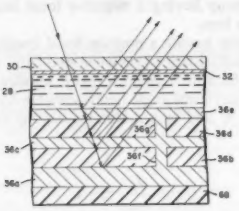
-continued

Lens		f = 26.0–31.0	view angle 2ω = 81.2°–70.8°		
L_i	j,k	r	d	n	v
L_8	15	43.469	2.25	1.51823	59.0
	16	−23.588	0.10		
L_9	17	−89.373	1.47	1.51633	64.1
	18	−26.047			

4,185,894
DIELECTRIC REFLECTOR FOR SELECTIVE WAVELENGTH REFLECTION

Paul G. Hilton, Phoenix, Ariz.; Paul F. Robusto, Oceanside, and Craig P. Stephens, Carlsbad, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 13, 1978, Ser. No. 886,026
Int. Cl.² G02F 1/13
U.S. Cl. 350—338 **7 Claims**



1. In a liquid crystal display device for providing a display in response to control signals and video signals applied thereto, said display panel being of the type comprising a transparent electrode plate adapted for being biased to a preselected electrical potential level, a semiconductor backplate disposed adjacent to and spaced from said transparent electrode plate, reflective electrode means supported on said backplate and positioned adjacent to and spaced from said transparent electrode plate, means for confining a quantity of liquid crystal material disposed in the space between said transparent electrode plate and said reflective electrode means, and means to apply said control signals and video signals to said reflective electrode means, the improvement comprising:

said reflective electrode means comprising alternately deposited thin films of silicon and silicon dioxide layers respectively arranged in a sequence of at least one layer of each type, said silicon film containing an impurity which renders it electrically conductive.

4,185,895
REFLECTIVE MODE, DYNAMIC SCATTERING LIQUID CRYSTAL DISPLAY SYSTEM HAVING A FRESNEL REFLECTOR FOR LIGHTING

Craig P. Stephens, Carlsbad, and Andrew G. Toth, Ramona, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

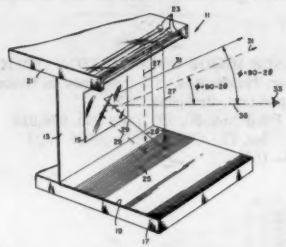
Filed Mar. 31, 1978, Ser. No. 891,994
Int. Cl.² G02F 1/13
U.S. Cl. 350—345 **16 Claims**

1. A display system comprising in combination:

(a) a base having a support surface extending in a first plane;

(b) a reflective mode, dynamic scattering, liquid crystal display mounted on said base and extending in a second plane transversely to said support surface;

(c) a Fresnel reflector mounted on said support surface in front of said liquid crystal display and extending transversely therefrom, said reflector having a plurality of reflective facets disposed in a plurality of planes, each

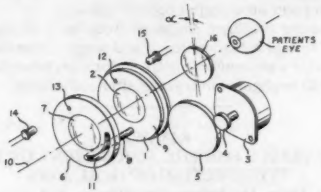


plane disposed at an acute included angle with the second plane of said liquid crystal display.

4,185,896
REFRACTOR CROSS-CYLINDER APPARATUS

Rato Buhler, Dudley, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Feb. 27, 1978, Ser. No. 881,341
Int. Cl.² A61B 3/02
U.S. Cl. 351—29 **8 Claims**



1. A refractor having a body; and cylinder lenses permanently located on a testing axis with a neutral orientation or a crossed orientation, the crossed orientation being for conducting Jackson cross-cylinder tests, the cylinder lenses being of effectively equal and opposite power, which comprises,

two ring members carried by said body and adapted to rotate about an axis coincident with the testing axis, each of said ring members being adapted to carry one of the two cylinder lenses,

drive means for rotating one of said ring members in either direction,

connecting means for transmitting rotational motion of said one of said ring members to the other of said ring members, said connection means including lag means permitting the other of said ring members to remain stationary during the first 90° of rotation of said one of said ring members when said one of said ring members is driven in a direction of rotation opposite to the preceding direction of rotation.

4,185,897
PROSTHETIC ASPHERIC SPECTACLE LENS FOR APHAKIA

Philip M. Frieder, 7441 SW. 145 Ter., Miami, Fla. 33158

Continuation-in-part of Ser. No. 831,814, Sep. 9, 1977, abandoned. This application Dec. 29, 1978, Ser. No. 974,250
Int. Cl.² G02B 3/04; G02C 7/02
U.S. Cl. 351—167 **16 Claims**

1. A spectacle lens blank for aphakic eye, comprising:

a lens body having a posterior surface and an anterior surface,

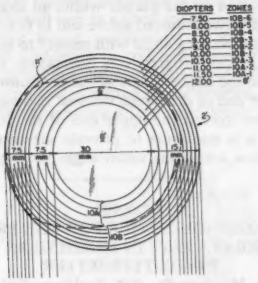
said anterior surface having a spherically curved central

zone and an aspheric peripheral zone surrounding said central zone,

said central zone having a uniform diopter curvature between +10 to +16 diopters,

said peripheral zone having a diopter curvature the same as said central zone immediately adjacent thereto and radially decreasing in diopter power at a rate of change between 0.40 to 0.51 diopters per millimeter,

whereby said approximate central zone together with sufficient amounts of asphericity allows for a clear field of vision for a centrally fixed eye, yet allows the eye to rotate toward the edge of said spectacle lens and use central vision through said peripheral zone of said spectacle lens.

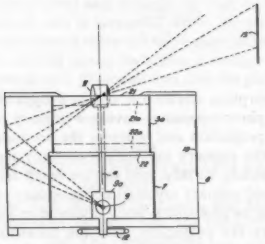


4,185,898

DEVICE FOR PROJECTING A FILM PICTURE

Hermann H. Seitz, Niederwangen, Switzerland, assignor to Infra-Vision AG Zug, Switzerland

Filed Oct. 31, 1977, Ser. No. 846,992
Int. Cl.² G03B *37/00*
U.S. Cl. 352—69 **6 Claims**



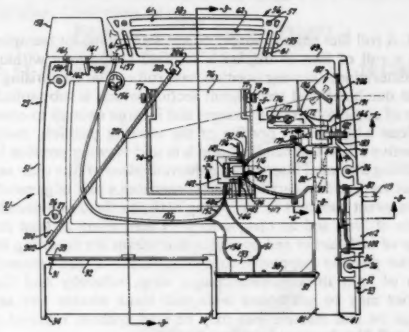
1. A device for projecting a film picture strip at an image angle including an angle of substantially 360°, comprising first and second spaced apart coaxial rings having cylindrical circumferential surfaces which have diameters equal to each other and serve as supports for the margins of the film picture strip, feed means including first means for guiding a film strip radially inwardly toward said rings with its margins guided over said circumferential surfaces and second means for guiding said strip radially outwardly from said rings, said first and second feed means being located closely adjacent each other so that the film is fed over substantially the whole of said circumferential surfaces, a point source of light disposed on the axis of said rings and spaced downwardly of said rings, a cylindrical mirror for reflecting the rays of said source of light coaxial with and disposed radially outwardly of said rings having at least a portion above said source of light to reflect the rays from the source of light upwardly and radially inwardly through the film strip guided over said circumferential surfaces, a cylindrical intercepting surface coaxial with said rings and disposed above said rings for receiving the rays reflected through the film strip, and a rotatable lens disposed along the axis of said rings in a position above said source of light and below said intercepting surface to receive the rays projected from said mirror through the film strip and to focus them on said intercepting surface.

4,185,899

COMBINATION VIEWER AND PROJECTOR

Hugh P. Sherlock, Palo Alto; Edwin E. Ewry, Mill Valley; Werner E. Sandvoss, San Jose; Werner W. Ciupke, Burlingame; Glenn E. Brown, Los Gatos, and William T. Link, Berkeley, all of Calif., assignors to Action Films, Inc., Mountain View, Calif.

Continuation of Ser. No. 410,819, Oct. 29, 1973, abandoned.
This application Jun. 1, 1976, Ser. No. 691,385
Int. Cl.² G03B *21/10, 21/16*
U.S. Cl. 352—72 **18 Claims**



1. In a combination viewer and projector , a housing having a front side with a slot and an opening formed therein, a magazine removably mounted in said housing and having an aperture, said magazine when mounted in said housing having a portion thereof extending through said slot in said housing and being accessible from the exterior of the housing to facilitate insertion and removal of the magazine into and from the housing through the front side of the housing, said magazine carrying a length of motion picture film adapted to be advanced in the magazine, said magazine having a single driven member accessible from the exterior of the magazine and driving means for engaging said film for advancing the film in forward and reverse directions in the magazine in a step by step manner to form motion pictures, said single driven member serving as the sole means for driving the driving means for engaging said film for advancing the film, a source of light in the housing, means in said housing and in said magazine for receiving light from said source of light and directing it through said film to provide an optical image in the aperture, a rear-lighted viewing screen carried in said housing and viewable through the opening in the front side, said housing having a shroud formed on the front side thereof which extends outwardly from the face of the screen and which generally surrounds the screen and the portion of the cartridge that is exterior of the housing, said housing being formed with a projection opening, reflecting means in said housing for receiving said image and for directing said image onto said screen or alternatively through said projection opening, a drive member mounted in said housing which removably engages said driven member of said magazine and means carried by the housing engaging said driven member to cause rotation of the drive member and the driven member to thereby cause movement of said film so that motion picture images are formed for viewing.

4,185,900

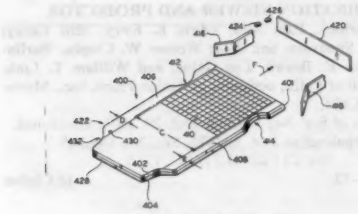
ROLL FILM READER/PRINTER WITH MANUALLY INSERTABLE DISCRETE FILM

K. George Rabindran, Morton Grove, and David G. Stites, Elgin, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Jun. 26, 1978, Ser. No. 919,360

Int. Cl.[2] G03B *21/00*

U.S. Cl. 353—26 R **11 Claims**



1. A roll film reader/printer comprising means for transporting a roll of film to display a selected image area within a predetermined viewing position, said roll of film comprising at least one blank and transparent section which is substantially free of any photographic images and is large enough to cover at least a substantial portion of the viewing position, means effective when said blank section is in said viewing position for enabling manual insertion of a discrete piece of film over said blank section, film carrier means comprising a pair of generally transparent members for receiving between them said discrete piece of film, and an opaque strip formed along at least one edge of said carrier and optical sensor means for detecting the carrier position responsive to a transmission or non-transmission of light through said opaque strip, whereby said film carrier may be positioned over said blank section and any image on said discrete film may be read without removal of said roll film from said reader/printer.

4,185,901

READING DEVICE

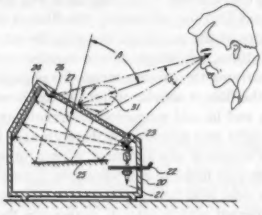
Karl-Günter Behr, Biebertal, Fed. Rep. of Germany, assignor to Minox GmbH, Giessen, Fed. Rep. of Germany

Filed Nov. 9, 1977, Ser. No. 849,898

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1976, 2651219

Int. Cl.[2] G03B *21/60, 23/08, 21/28*

U.S. Cl. 353—27 R **8 Claims**



1. A reading device for viewing microfilms, transparencies, fiches and the like, said device comprising:

a plate-shaped projecion screen made of transparent material, said screen being inclined to the horizontal at an acute angle and having upper and lower ends and opposite sides, said screen having on one side a frosted surface, said surface constituting the viewing side of the screen; prism-shaped parts disposed on the opposite side of the projection screen; a source of light on said opposite side of the screen; a carrier for placing thereupon microfilms, transparencies and fiches to be projected; and a mirror assembly disposed to reflect rays of light from said source of light thorugh said prism-shaped parts upon and through said projection screen, said prism-shaped parts being disposed in lengthwise rows and having prism surfaces extending at an angle with respect to said opposite side of the projection screen for deflecting light rays reflected from the mirror assembly so as to project an image of the article placed on the carrier within an angle converging toward a viewer situated above and in front of the screen at an acute viewing angle with respect to said screen, said prism surfaces progressively increasing in angle with respect to the opposite side of the projection screen from the lower end of the screen whereat said angle is substantially zero toward the upper end of the screen whereat said angle is maximum to provide substantially uniform illumination within the visual angle of the observer.

4,185,902

LIGHT ABSORPTION DEVICE FOR THE PREVENTION OF STRAY LIGHT IN PARTICULAR IN A PHOTOTYPESETTER

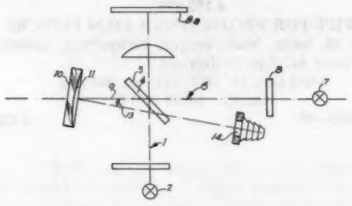
Michael Plaot, Hamburg St., #36, Eschborn, Fed. Rep. of Germany, assignor to Michael Plaot, Eschborn, Fed. Rep. of Germany

Filed Jun. 2, 1978, Ser. No. 912,261

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1977, 2725107

Int. Cl.[2] B41B *21/24*

U.S. Cl. 354—5 **1 Claim**



1. An absorption device for use in a light ray projection system of a phototypesetter, having a primary ray and a secondary ray projection and wherein the secondary ray is directed into the primary ray with a partially translucent and partially reflecting surface, said surface being arranged within the path of said primary ray and said secondary ray projection, and including an absorption body disposed in an extension of the secondary ray projection from the backside of said partially reflecting and partially translucent surface, said absorption body arranged to absorb radiation of said secondary ray, said absorption body having a concave surface arranged to direct said secondary ray at an angle relative to the direction of the secondary ray projection and at a focal point, and black body means for absorbing light placed at the focal point for absorbing light from said concave surface.

4,185,903

CAMERA HAVING SPATIALLY STABILIZED PHOTOCELL

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 21, 1977, Ser. No. 862,750

Int. Cl.[2] G03B *7/00, 19/00*

U.S. Cl. 354—59 **3 Claims**

1. A photographic camera comprising:

a housing;

an objective lens defining the optical axis of the camera;

a photocell unit having a given field of view, said unit in-

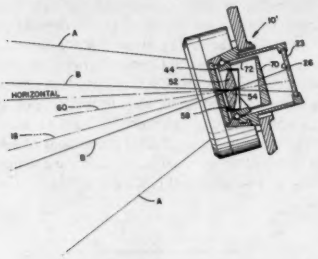
cluding a light sensitive element and a photocell lens for directing light onto a photosensitive surface of said element; and

means for mounting said photocell unit to spatially stabilize said field of view of said photocell unit, said mounting means comprising:

first bearing means responsive to limited pitching movement of the camera about a pitch axis perpendicular to the optical axis of the camera for maintaining the field of view of said photocell unit in a fixed spatial position;

second bearing means, independent of said first bearing means, and responsive to roll movement of the camera about its optical axis, for maintaining said field of view of said photocell unit in a fixed spatial position, said second bearing means including a ring pendulously mounted on said housing for rotation about an axis parallel to said camera optical axis with said photocell lens being mounted in said ring for directing light onto the photosensitive surface of said element; and

sensitivity control means for functionally relating the sensitivity of said photocell unit to the pitch angle of the camera optical axis such that said photocell unit has a predetermined sensitivity when the pitch angle of said camera optical axis is 0°, and wherein said sensitivity control means is constructed and arranged so that the response of said photocell unit is increased when the pitch angle is positive and reduced when the pitch angle is negative, said sensitivity control means including a wedge filter interposed between said photocell lens and the photosensitive surface of said element.

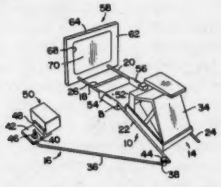


4,185,904

LIQUID CRYSTAL THERMOGRAPH FRAME ASSEMBLY

Herbert C. Eddy, P.O. Box 13126, Tampa, Fla. 33681

Filed Mar. 23, 1978, Ser. No. 889,427
Int. Cl.² G03B *29/00*
U.S. Cl. 354—80 **7 Claims**



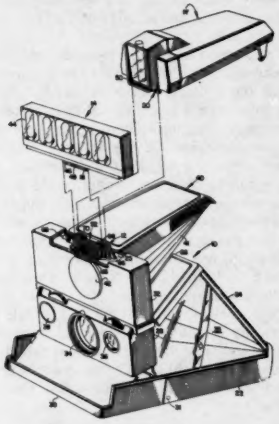
1. A liquid crystal thermograph frame assembly for use in combination with a sheet of liquid crystals and a camera for obtaining a permanent record of thermal variation of living tissue, said frame assembly comprising: base means comprising first and second planar segments disposed in abutting, non-linear intersecting relation to each other; crystal receiving means operatively disposed on the free end of said first planar segment; liquid crystal holder means removably attachable to said base means by said crystal receiving means, said liquid crystal holder means comprising first and second frame elements hingedly attached to each other and corresponding first and second apertures formed therein whereby a sheet of liquid crystals may be operatively retained between said first and second frame elements and operatively mounted on said free end of said first planar segment; camera mounting means formed on said second planar segment in substantially opposed relation to said crystal receiving means whereby a camera may be mounted thereon; and light source positioning means movably disposed on said second planar segment, at least a portion of said light source positioning means being disposable between said crystal receiving means and said camera mounting means whereby the sheet of liquid crystals may be illuminated.

4,185,905

DUAL PURPOSE FLASH/STROBE SOCKET ASSEMBLY FOR A PHOTOGRAPHIC CAMERA

John A. Lewis, Jr., Stoneham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 3, 1978, Ser. No. 892,493
Int. Cl.² G03B *15/03, 15/05*
U.S. Cl. 354—141 **14 Claims**



1. A dual purpose socket assembly for a camera for releasably connecting to the camera either a multilamp photoflash device or an electronic flash device wherein the camera is of the type that includes means for converting from an ambient exposure mode of operation to an artifical illumination exposure mode of operation in response to receipt of either device and, while in the artificial illumination exposure mode of operation, for providing a first set of electrical signals to the photoflash device by which the operation of the photoflash device can be controlled in a predetermined manner in conjunction with the camera operation and for providing a second set of electrical signals, which include selected signals from the first set, by which the electronic flash device also can be controlled in a predetermined manner in conjunction with the camera operation wherein the photoflash device is of the type having an array of lamps arranged on oppositely facing sides thereof and includes a two-sided, elongated, thin-bladed plug with a set of electrical contacts corresponding to each array of lamps on each side of the plug such that only one side of the photoflash device can be utilized at a time and wherein the electronic flash device is of the type which has an elongated blade-like plug of different configuration than the photoflash device plug and has arranged on both sides thereof electrical contacts which on one side correspond directly to the spatial arrangement of the contacts on each side of the photoflash plug and

are simultaneously utilized to operate the electronic flash device, said socket assembly comprising:

electrically nonconducting means for forming an open ended, single cavity socket structured to releasably receive either the connector plug of the photoflash lamp device or the connector plug of the electronic flash device along a common insertion path, to rigidly hold either plug, and adapted to be mounted on the camera so that either device, when connected with the camera, is positioned to illuminate a scene to be photographed, said cavity of said socket being defined by a series of spaced apart interconnecting wall sections two of which are arranged so that said open end thereof is a generally elongated slot extending to a given depth;

a first set of electrical contacts mounted on said socket forming means along one of said elongated wall sections in a spatial arrangement complementary to the spatial arrangement of the contacts on either side of the photoflash device plug and to all of the contacts on the side of the electronic flash device plug which has a contact spatial arrangement corresponding to that of the photoflash plug;

a second set of electrical contacts mounted on said socket forming means along said other elongated wall section in a spatial arrangement complementary to the spatial arrangement of the contacts on the other side of the electronic flash device plug, said other elongated wall being generally spaced from and opposite said one elongated wall so that said first set of contacts face said second set of contacts; and

means positioned in said cavity and structured for guiding the photoflash device plug into only a part of said cavity so that the contacts on one side of the photoflash device plug engage only said first set of contacts to provide an electrically conductive connection between the camera and the photoflash device along which the first set of camera electrical signals for controlling the photoflash device can be directed to control the photoflash device while keeping the contacts on the opposite side of the photoflash device plug from engaging said second set of socket contacts and for allowing the electronic flash device plug to fit substantially said entire cavity so that the contacts on both sides of the electronic flash device can simultaneously engage said second set of contacts and selected ones of said first set of contacts to provide an electrically conductive connection between the camera and the electronic flash device along which the second set of camera electrical signals for controlling the electronic flash device can be directed to control the electronic flash device.

4,185,906

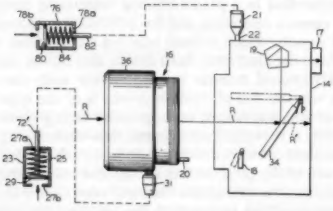
EXPOSURE DELAY MECHANISM

Robert T. Little, 160 Columbia Heights, Brooklyn, N.Y. 11201

Continuation-in-part of Ser. No. 816,362, Jul. 18, 1977, abandoned. This application Jun. 1, 1978, Ser. No. 911,376

Int. Cl.[2] G03B *17/38, 19/12*

U.S. Cl. 354—152 **21 Claims**



1. In a photographic camera of the type having a camera body in which is mounted a shutter, a camera operating mechanism and a reflex mirror mounted for movement between a first, view-finding position and a second, film-exposing position, said camera operating mechanism having a path of travel and including a mirror operating mechanism operatively connected to said mirror to move said mirror to said film exposing position and a shutter operating mechanism operatively connected to said mirror for movement along a path of travel from a first position to a second, shutter-opening position upon movement of said mirror to said film-exposing position and to be restrained from such movement while said mirror is in said view-finding position,

the combination therewith of an exposure delay mechanism comprising:

(a) manually operable actuating means operatively connected to said mirror operating mechanism to effect actuating thereof upon a first manipulative action thereon; and

(b) blocking means mounted on said camera and operatively connected to said actuating means for movement between a blocking position in said path of travel of said shutter operating mechanism and a release position removed from said path by a second manipulative action upon said actuating means, whereby operation of said shutter may be deferred for a time interval after movement of said mirror to said film exposing position by deferring action of said actuating means upon said blocking means for the desired interval.

4,185,907

SUPPORT ASSEMBLY FOR COMPONENTS OF ELECTROSTATIC COPIERS

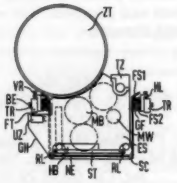
Erich Baier, Sunzhausen, and Hans Hahn, Unterhaching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 17, 1977, Ser. No. 842,609

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1977, 2717269

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—3 R **7 Claims**

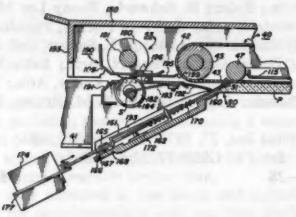


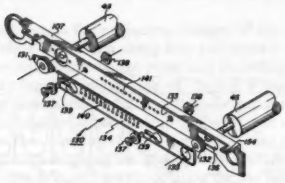
1. A mounting for operating units having an operating position adjacent an intermediate carrier in an electrostatic copier comprising: a carriage member, an operating unit received in the carriage member, the carriage member being suspended on a frame means of the copier, the suspension including slide guides allowing the carriage to be slid with respect to the frame of the copier axially of the intermediate carrier, the operating unit being adjustably mounted within the carriage, the adjustable mounting allowing the operating unit to be moved towards and away from a surface of the intermediate carrier, the carriage is equipped with rail means on which roller members ride, the roller members eccentrically mounted to the operating unit, rotation of the roller members with respect to the operating unit moving the operating unit with respect to the carriage, the operating unit has transverse ends adjacent axial ends of the intermediate carrier, each transverse end being provided with two such rollers, and the rollers on each end being linked together for simultaneous rotation.

4,185,908
VERNIER BELT TENSIONING SYSTEM FOR A PHOTOCOPYING MACHINE

Thomas N. Taylor, Rochester; Charles J. Mahler, Fairport, and James M. Stana, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 30, 1977, Ser. No. 811,736
Int. Cl.² G03G *15/00*; G03B *27/62*
U.S. Cl. 355—3 R **14 Claims**





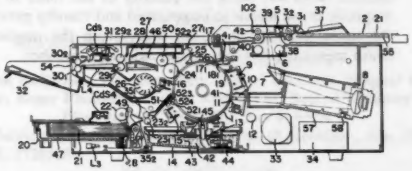
1. In a belt transport for transporting a sheet along a desired path, said transport comprising:

at least one belt arranged for movement about first and second belt support members, and a frame for supporting said members for rotation, said frame including tensioning means for adjustably tensioning said belt by changing the relative distance between said members, the improvement wherein said belt tensioning means comprises a vernier means for providing a fine adjustment of said belt tension, said vernier means including first and second adjustable side frames arranged to support said first and second belt support members adjacent opposing ends thereof, said first and second adjustable side frames each comprising first and second vernier members arranged in overlapping fashion for sliding movement relative to one another, said vernier means including vernier indicating means for indicating the relative overlapped position of said vernier members, said first vernier members supporting said first belt support member and said second vernier members supporting said second belt support member whereby relative movement of said first and second vernier members with respect to one another provides corresponding relative movement of said first and second belt support members to change said belt tension, said vernier means allowing said belt tension to be adjusted while maintaining the parallelness of said first and second belt support members.

4,185,909
CLEANING METHOD AND DEVICE FOR ELECTROPHOTOGRAPHIC MACHINE

Shigehiro Komori; Hisashi Sakamaki, both of Yokohama; Hiroyuki Hattori, Mitaka; Toshihide Iida; Koichi Miyamoto, both of Tokyo, and Kazumi Umezawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 600,860, Jul. 31, 1975, Pat. No. 4,017,170, which is a continuation of Ser. No. 348,092, Apr. 5, 1973, abandoned. This application Mar. 16, 1977, Ser. No. 778,180
Int. Cl.² G03G *21/00*
U.S. Cl. 355—15 **51 Claims**



1. An electrophotographic machine comprising:

a rotatable medium;

means for forming an electrostatic latent image on said rotatable medium;

liquid developing means for visualizing the electrostatic latent image to form a toner image;

means for transferring the developed toner image to transfer material;

means for cleaning said rotatable medium for repetitive use;

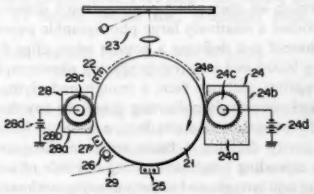
means for starting the operation of the machine; and

means for rotating, after the activation of said starting means, said rotatable medium during operation of said cleaning means, for a predetermined period of time prior to intiating operation of said image forming means, to form the latent image on a portion of said rotatable medium cleaned by said cleaning means, wherein said predetermined time corresponds to at least one full turn of said rotatable medium.

4,185,910
PHOTOCONDUCTIVE MEMBER CLEANING DEVICE USING A MAGNETIC BRUSH FOR ELECTROSTATIC COPYING MACHINES

Yutaka Nomura, Yokohama, and Mitsuaki Koyama, Kurume, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 31, 1977, Ser. No. 847,051
Claims priority, application Japan, Jun. 30, 1976, 51-77403; Jun. 30, 1976, 51-77404
Int. Cl.² G03G *21/00*
U.S. Cl. 355—15 **14 Claims**



9. A cleaning device for removing toner from a photoconductive member which is used in an electrostatic copying apparatus for successively executing charging, exposure for forming a latent image on the photoconductive member, devel-

opment, transfer, charge removal and cleaning against the photoconductive member, comprising:

a magnetic brush means for the development and cleaning of said photoconductive member; and

means for applying during the development to the magnetic brush means a first bias voltage at a given level and having the same polarity as the electrostatic latent image, and means for applying during the cleaning a second bias voltage of the same polarity as that of the electrostatic latent image and having a level which is lower than the first bias voltage, said second bias voltage being set at such a level that the potential difference between the second bias voltage and the potential of the photoconductive member does not cause the polarity of the toner in the magnetic brush means to be reversed and thereby prevent the toner from being driven away from the magnetic brush means toward the photoconductive member.

4,185,911

PHOTOGRAPHIC ENLARGEMENT AND DEVELOPMENT APPARATUS

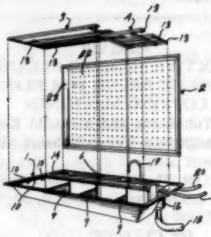
Rejean Guillemette, 715 Real St., La Tuque, Quebec, Canada (G9X 2S4)

Continuation-in-part of Ser. No. 756,633, Jan. 4, 1977, abandoned. This application Jul. 28, 1978, Ser. No. 928,947

Claims priority, application United Kingdom, Jul. 14, 1976, 29401/76

Int. Cl.[2] G03D *13/04*

U.S. Cl. 355—27 **4 Claims**



1. A photographic enlargement and development device comprising an upstanding posting board dimensioned to accommodate a relatively large photographic paper against one face thereof and defining a bottom edge, clips fixable to said posting board and removably affixing photographic print material against said one face, a trough underlying said bottom edge and operatively collecting drip from any developed print posted wet against said one face, a sink unit having a drain, a main cavity defining a basin area, an elongated secondary cavity extending lengthwise along one side of said basin area, forming said trough, and communicating with said main cavity and said drain, and a lattice operatively resting on said sink unit, overlying said main cavity, forming a pervious support for resting photographic development accessories thereon, and having predetermined apertures therethrough allowing access to said main cavity.

4,185,912

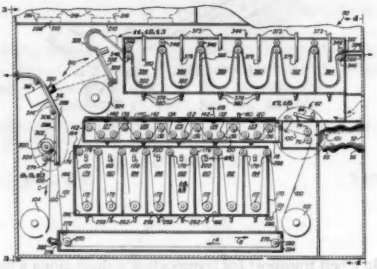
PHOTOGRAPHIC DEVELOPER AND PRINTER

Theodore F. Schwartz, 11160 St. Andrews Way, Scottsdale, Ariz. 85251, assignor to Theodore F. Schwartz, Scottsdale; Lester J. Hayt, Sr., Phoenix; William H. Yost, Sun City, all of, Ariz.; Gail M. Hall, Newhall, Calif.; Lester J. Hayt, Jr., Tucson, Ariz.; Nancy J. Hayt; Michelle J. Butts, both of Phoenix, Ariz.; Ray R. Hall, Burbank, Calif.; Gary Hall, Sylmar, Calif.; Philip Hall, Carmichael, Calif.; Caroline Bouher, Phoenix, Ariz.; Hilda Ross, Aurora, Ind.; Howard Ross, Sr., Aurora, Ind.; Howard Ross, Jr., Aurora, Ind.; Marilyn Seal, New Orleans, La.; John D. Ross, Aurora, Ind.; Richard A. Schwartz, Scottsdale, Ariz.; Josette M. Lagardere; Josette Lagardere, both of Springville, Calif.; John R. Lagardere, Lawndale, Calif.; George Newton, Stratford, N.J.; Camilla M. Burnette, Tulsa, Okla.; Emily Jean Troupe, Foster City, Calif.; S. Paul Ferrin; Arthur D. Ehrenreich, both of Phoenix, Ariz.; Robert D. Schwartz; Penny Lee Masterson, both of Scottsdale, Ariz.; Cathy Jo Fischer, Paradise Valley, Ariz.; Cindy Sue Schwartz; Jacquie L. Serrett, both of Scottsdale, Ariz.; Daniel Grubb, Phoenix, Ariz.; Bette M. Gary; Leonard Bronstein, both of Paradise Valley, Ariz.; Theodore S. Toth, Phoenix, Ariz. and Kenneth M. Brown, Torrance, Calif.

Filed Jun. 27, 1977, Ser. No. 810,108

Int. Cl.[2] G03B *27/32*; G03D *3/13*

U.S. Cl. 355—28 **17 Claims**

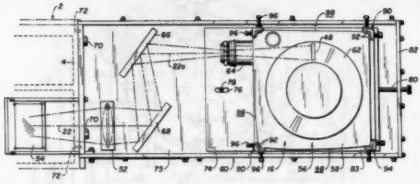


1. In a photo developer and printer the combination of: a housing having a darkroom interior; film transport means in said darkroom interior of said housing; means traversed by said film transport means for developing film in said housing; printing means communicating with said film transport means and disposed in said housing and adapted to photographically print pictures from developed film; a film input compartment in said darkroom interior of said housing; said film transport means having a film receiving end in said input compartment; said housing having hand receiving openings communicating with the interior of said compartment; flexible light trap sleeves in said compartment surrounding said hand receiving openings and adjacent said receiving end of said film transport means; whereby human hands may be projected through said hand receiving openings from the outside of said housing and into said light trap sleeves in said compartment for inserting undeveloped film into said film receiving end of said film transport means; said housing having a film outlet opening for delivering developed film from said film transport means to the exterior of said housing; and a photo print outlet opening in said housing for delivering photo prints from said printer to the exterior of said housing.

4,185,913
APPARATUS FOR RECORDING MULTIPLE, SUPERIMPOSED, INDEPENDENT IMAGES ON MICROFILM

Stephan K. Ammann, Cupertino, and Siegfried H. Mohr, Santa Clara, both of Calif., assignors to Quantor Corporation, Mountain View, Calif.

Filed Dec. 15, 1977, Ser. No. 860,802
Int. Cl.² G03B *27/70, 21/26;* F16M *1/00;* G03B *27/62*
U.S. Cl. 355—43 **2 Claims**

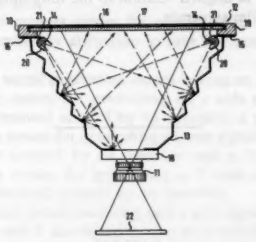


1. A microfiche recorder comprising in combination:
a frame including means for positioning a microfiche in an image plane;
a CRT screen mounted to the frame and means for displaying thereon computer output data;
a form slide mounted to the frame and including a raster plate for superimposition with the data displayed on the CRT;
first optical means for projecting images of the raster plate and of the CRT screen along first and second optical axes onto the microfiche image plane and including lens means for reducing the image size of the CRT and the raster plate so as to render their image sizes in the image plane identical, and reflector means in the first and second optical axes for changing the direction of at least one of them and optically aligning the images with each other so as to effect their precise superimposition on the microfiche;
an optical bench constructed independently of the frame and means for precision aligning the bench with the frame, and further means for demountably securing the bench to the frame;
a slide projector mounted to the optical bench and including means for storing a plurality of photographic slides each carrying a graphic image, an objective for projecting the graphic images along a third optical axis, and means for selectively registering any one of the slides on the storage means with the projecting means;
a field lens positioned in the third optical axis and disposed in the focal plane of the objective for refocusing the graphic image in the microfiche image plane;
slide merging optics disposed in the third optical axis downstream of the field lens for combining and optically aligning the graphic image with at least one of the projected images of the CRT screen and the raster plate so that the projected graphic image is in optical alignment with the projected images from the screen and the raster plate; and
adjustment means permitting the multi-directional adjustment of the slide projector in relation to the optical bench of said frame for optically aligning the third optical axis with the first and second optical axes, the adjustment means including a base slidably carried by said optical bench, and a platform spaced from said base for supporting said slide projector, vertical adjustment means comprising a plurality of vertically adjustable positioning members connected with the optical bench and with the platform for supporting and vertically positioning the slide projector for moving the projector in a vertical direction and for tilting the projector about a horizontal axis, horizontal adjustment means for moving the slide projector relative to the optical bench in a generally horizontal direction, the last mentioned means including a plurality of upright post means anchored to said platform and disposed closely adjacent to and spaced from a body of the slide projector, horizontally movable means engaging the post means and constructed to engage the sides of the slide projector and selectively linearly and pivotally move the slide projector in a plurality of generally horizontal directions, means operably connecting the base and the optical bench for slidably moving the base and the slide projector generally parallel to the optical bench to facilitate the proper magnification of the graphic image in the field lens, and means for locking the slide projector against further vertical and horizontal movements relative to the vertical positioning members and the post means after the third optical axis has been aligned with the first and second optical axes.

4,185,914
REPRODUCTION CAMERAS AND PRIMING EXPOSURE DEVICES THEREFOR

Bernd Holthusen, Hamburg, Fed. Rep. of Germany, assignor to Dr. Boger Photosatz GmbH, Wedel, Fed. Rep. of Germany

Filed Jun. 28, 1978, Ser. No. 919,974
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1977, 2729378
Int. Cl.² G03B *27/54*
U.S. Cl. 355—70 **20 Claims**



1. A reproduction camera suitable for producing screen modified images and comprising an objective, a film holder arranged spaced from the objective substantially at the image plane thereof, wall means impermeable to light and extending between the objective and the film holder, at least one source of light for producing a priming exposure and disposed inside the wall means in the region of the film holder, means for preventing direct impingement of light from said at least one source onto the image plane and the interior of said wall means being provided with a light scattering surface for producing scattering of light received from said at least one source onto said image plane.

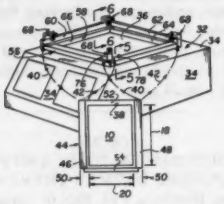
4,185,915
METHOD OF PRODUCING MULTIPLE IMAGE FORMATS

Ivan Volent, 1600 Center Ave., Fort Lee, N.J. 07024, and Saul Fermaglich, 15 School House Rd., Woodcliff Lake, N.J. 07675

Filed Feb. 21, 1978, Ser. No. 879,153
Int. Cl.² G03B *27/32*
U.S. Cl. 355—77 **4 Claims**

1. A method of conforming the orientation of multiple images to a rectangular film substrate incident to the reproduction thereof on said rectangular film substrate in said conformed orientation, said method comprising the steps of displaying in sequence each of a selected number of images destined for reproduction on said film substrate in uniformly similar orientations on a rectangularly shaped display screen, establishing an image display station in a clearance position from said display screen by locating at least two film-positioning rails in perpendicular relation to each other and in aligned

relation to perpendicularly oriented sides of said rectangular display screen, projecting each said image while maintaining the orientation thereof from said display screen to said display station, and positioning a film substrate by linear movement thereof along one or the other of said film-positioning rails incident to selecting one of two orientations of a perpendicular



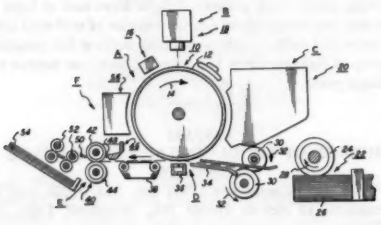
relation to each other for said film substrate during the positioning thereof in image-transferring relation to said projected images at said image display station, whereby said selected film substrate orientation contributes to the positioning of the larger number of the multiple images in any format arrangement thereof in aligned relation to the long dimension of said rectangular film substrate.

4,185,916

COMPOSITE DEVELOPER PARTICLES AND APPARATUS FOR USING SAME

Roger L. Miller, Penfield, and Lloyd F. Bean, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 8, 1977, Ser. No. 785,798
Int. Cl.[2] G03G *15/08, 15/09*
U.S. Cl. 355—3 DD **20 Claims**



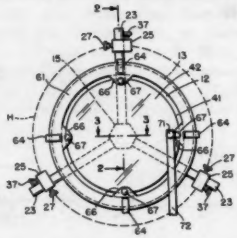
1. An electrophotographic printing machine, including:
a photoconductive member;
means for charging at least a portion of said photoconductive member to a substantially uniform level;
means for exposing the charged portion of said photoconductive member to a light image of an original document being reproduced; and
means for developing the latent image recorded on said photoconductive member with composite particles having a conductive portion and an insulating portion with the conductive portion and insulating portion being integral and contiguous with one another.

4,185,917

FRONT WHEEL MIRROR MOUNTING DEVICE ALIGNMENT APPARATUS

Pierre A. Alsina, Rochester, N.Y., assignor to SpinOptic, Inc., Hornell, N.Y.

Filed Dec. 12, 1977, Ser. No. 859,466
Int. Cl.[2] G01B *5/255;* G02B *5/08*
U.S. Cl. 356—155 **7 Claims**



1. A device for mounting a reflecting surface on the wheel of an automotive vehicle, comprising
a housing having an integral hub projecting from one side thereof,
a plurality of rigid arms fixed to and projecting radially outwardly from said hub at angularly spaced points about the center of said hub,
a plurality of clamps mounted on said arms for adjustment longitudinally thereof, and having laterally projecting hook-shaped portions engageable releasably over the rim of a wheel of a vehicle removably to secure said housing against rotation on said wheel, and approximately centrally thereof, and
means mounting a reflecting member on the side of said housing opposite said hub for universal adjustment relative to said housing about a point located on the centerline of said hub,
said member having thereon a plane reflecting surface facing away from said housing,
a plurality of adjusting elements on said housing engageable with said member at a plurality of points angularly spaced about the axis of said hub, and operable for adjusting said member about said point, and
means mounting said adjusting elements on said housing for rotational adjustment around the outside of said housing, thereby to change the points where said elements engage said member.

4,185,918

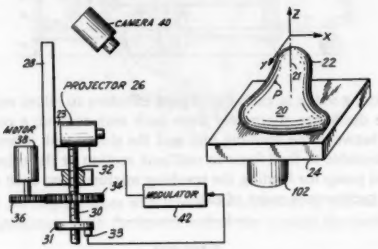
ARRANGEMENT FOR SENSING THE CHARACTERISTICS OF A SURFACE AND DETERMINING THE POSITION OF POINTS THEREON

Paul L. DiMatteo, Huntington; Joseph A. Ross, Fort Salonga, and Howard K. Stern, Greenlawn, all of N.Y., assignors to Solid Photography Inc., Melville, N.Y.

Filed Aug. 27, 1975, Ser. No. 608,266
The portion of the term of this patent subsequent to Feb. 11, 1992, has been disclaimed.
Int. Cl.[2] G01B *11/00;* G01C *11/02, 11/12;* G03B *5/04*
U.S. Cl. 356—375 **51 Claims**

1. A method for sensing and locating points on a surface comprising the steps of: generating a projection field directed onto a surface; applying relative motion between said projection field and said surface in at least one direction parallel to a coordinate axis applied to the surface; subdividing said projection field into a number of selected sections during said relative motion and irradiating said surface with different variations of said subdivided projection field so that each section is illuminated at least once; recording within a field of view images of said surface as irradiated by the subdivided projection field,

recording a calibrated reference surface and reading said recorded images in relation to said reference surface to define the location of a predetermined point on said surface first-mentioned and appearing within said field of view; projecting in sequence by said projection field preselected patterns onto the surface for subdividing the projection field into predetermined sections, said projected patterns on said surface having irradiated sections and non-irradiated sections, each pattern of irradiated sections and non-irradiated sections corresponding to an assigned code; said reading step comprising further reading each projected pattern of irradiated and non-irradiated sections



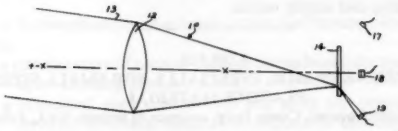
and reading the sections in which a preselected point appears; combining said patterns for obtaining a predetermined total number of sections, said projection field being subdivided into said total number of sections, the number of said patterns and the total number of sections being related by said assigned code; and relating the patterns and sections in which the point appears to identify the position in three-dimensional space of the point on said surface; said relative motion including the step of traversing said surface with said projection field for each of said patterns, said projection field and said surface being moved relative to each other progressively to form a pattern during a traversal of said surface.

4,185,919

QUADRANT DETECTION SYSTEM

Tommy L. Williamson, Kettering, and Harold W. Rose, Xenia, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 8, 1973, Ser. No. 369,030
Int. Cl.[2] G01B *11/26;* G02B *5/18*
U.S. Cl. 356—141 **2 Claims**



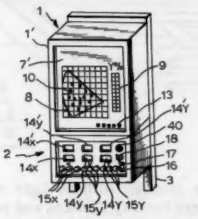
1. A detection system for providing directional information concerning illumination reaching the detecting system from a distant source, comprising: an objective lens adapted to receive illumination; a holographic lens positioned approximately at the back focal plane of said objective lens, a plurality of photoelectric point detectors positioned around the periphery of the holographic lens and spaced therefrom on the side remote from said objective lens; said holographic lens including a plurality of means for imaging light from the objective lens, falling on each imaging means, onto predetermined corresponding ones of said photoelectric detectors.

4,185,920

COLOR DISPLAYING APPARATUS

Nagaichi Suga, 32 Banshu-cho, Shinjuku-ku, Tokyo, Japan

Filed May 30, 1978, Ser. No. 910,948
Claims priority, application Japan, Oct. 13, 1977, 52-121930
Int. Cl.[2] G01J *3/50*
U.S. Cl. 356—406 **6 Claims**



1. A color displaying apparatus comprising:

a display board assembly having a first transparent plate, a translucent display board on which an x-y chromaticity chart and a Y brightness scale are marked, a ferromagnetic wire screen and a second transparent plate clamped together as a unit;

a plurality of magnet pieces for adhereing to said display board assembly by attraction to said ferromagnetic wire screen;

a coordinate signal generating means having an x axis signal generating means for generating an x axis signal in response to manual control by an operator, a y axis signal generating means for generating a y axis signal in response to manual control by an operator and a Y axis signal generating means for generating a Y axis signal in response to manual control by an operator;

a digital display means receiving said x axis signal, said y axis signal and said Y axis signal having an x axis display means for displaying said x axis signal, a y axis display means for displaying said y axis signal and a Y axis display means for displaying said Y axis signal;

a x-y chromaticity coordinate setting means receiving said x axis signal and said y axis signal, located on the reverse side of said display board assembly, having a first light spot means for producing on said translucent display board a light spot visible from the front of said display board assembly at a position relative to said x-y chromaticity chart of said translucent display board corresponding to said x axis signal and said y axis signal;

a Y brightness scale setting means receiving said Y axis signal, located on the reverse side of said display board assembly, having a second light spot means for producing on said translucent display board a light spot visible from the front of said display board assembly at a position relative to said Y brightness scale of said translucent display board corresponding to said Y axis signal.

4,185,921

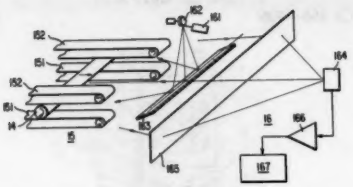
SURFACE FLAW DETECTOR

Tomokazu Godai, Kamakura; Yasuhito Takeuchi; Kozo Nakai, both of Fujisawa; Kazuo Takeuchi, Kamakura, and Yoshihisa Morioka, Kawasaki, all of Japan, assignors to Kobe Steel Limited, Kobe, Japan

Filed Jan. 18, 1978, Ser. No. 870,497
Claims priority, application Japan, Jan. 19, 1977, 52-4022
Int. Cl.[2] G01N *21/32*
U.S. Cl. 356—426 **3 Claims**

1. A surface flaw detector comprising a light source for generating a laser beam, a material conveyance means for conveying the material to be inspected in the direction transverse to the axis of said material while rotating said material around its axis, means for scanning said laser beam on the full

length and circumference of the surface and in the axial and conveying direction of the material while said material is rotating on its axis and being conveyed, optical means for forming a stationary optical image of said scanning means with the light



reflected from the material surface, light receiving means provided at the image forming position, and processing means which receives the output from said light receiving means to discriminate the flaw signals.

4,185,922

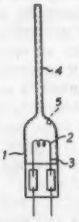
METHOD OF INTRODUCING FLUORINE INTO A LAMP

John M. Rees; Christopher A. Horler, both of London, and Anthony P. Downing, Runcorn, all of England, assignors to Thorn Electrical Industries Limited and Imperial Chemical Industries Limited, both of London, United Kingdom

Division of Ser. No. 759,705, Jan. 17, 1977, Pat. No. 4,090,101. This application Feb. 23, 1978, Ser. No. 880,569

Int. Cl.[2] H01J *9/395*

U.S. Cl. 316—5 **3 Claims**



1. A method of making an electric lamp comprising the steps of

providing a lamp envelope fitted with an electrically activated light structure and conducting leads thereto;

dissolving a fluorocarbon polymer in a solvent therefor to produce a solution;

introducing a controlled quantity of said solution into said envelope to provide a source of fluorine;

removing the solvent from said solution to provide a residue of said fluorocarbon polymer; and

sealing said envelope;

the presence of said fluorocarbon polymer thereby permitting the formation of a gas fill which includes fluorine within said envelope when said lamp is activated.

4,185,923

METHOD AND APPARATUS FOR PRODUCING INSULATING MATERIAL

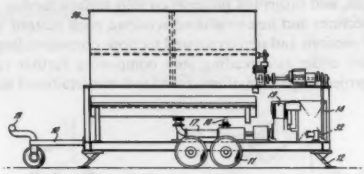
David W. Bouette, 28 Manor Crescent, Tytherington, Macclesfield, Cheshire; Donald E. Baker, The Shambles, Sugar La., Rushton Spencer, Macclesfield, Cheshire, and Fred Cartwright, Roseleigh, Hare La., Pipers Ash, Chester, all of England

Filed Jul. 11, 1977, Ser. No. 814,657

Int. Cl.[2] B28C *5/00, 5/12*

U.S. Cl. 366—10 **2 Claims**

1. Apparatus for producing an insulating material comprising a supply tank for water and wetting agent, a compressor for producing a compressed air supply, a foaming unit connected to the compressor and supply tank, a batch accumulator slurry tank including two tank portions separated by a vertical partition, an agitator comprising a shaft rotatable about a horizontal axis, spaced apart radial extending paddles on said agitator shaft in each tank section, an outlet pipe for each tank



section, a valve in each outlet pipe effective to allow material to be discharge alternately from each tank section, a connection between the foaming unit and the slurry tank alternately positionable to feed foam to one tank section or the other and a feed pump for feeding the resulting mixture from each slurry tank section to a point of use.

4,185,924

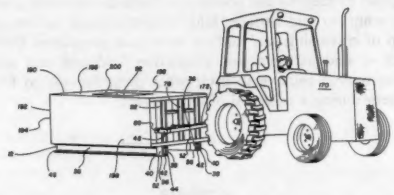
FLOWABLE MATERIAL PUMP APPARATUS

Douglas L. Graham, Auburn, Ind., assignor to Solarcrete Corporation, Florence, Ky.

Filed Aug. 28, 1978, Ser. No. 937,555

Int. Cl.[2] B28C *5/06*

U.S. Cl. 366—10 **16 Claims**



1. A flowable material pump apparatus for coupling to an application assembly and vehicle comprising a frame, means attached to said frame for coupling said frame to said vehicle and for causing said frame to travel in a spacially consistent fashion with respect to said vehicle, means on said frame for supplying to said application assembly said flowable material, means on said frame for supplying to said application assembly a flowable material propellant, and means on said frame for powering said supply means.

4,185,925

TAPERED-END SILO, ESPECIALLY FOR SMALL-SIZED PLASTICS MATERIAL

Domenico Gazzoni, Como, Italy, assignor to Sorema S.r.l., Erba, Italy

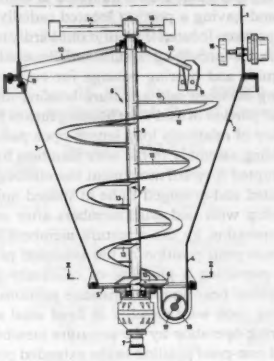
Filed Jun. 19, 1978, Ser. No. 916,737

Int. Cl.[2] B01F *7/16*

U.S. Cl. 366—69 **2 Claims**

1. A tapered-bottom silo, particularly suitable for small sized plastics material having characteristics of low density and a high degree of stickiness, humidity and electrostaticity, characterized in that it comprises a conicalscrew stirring member with constantly increasing diameter and constant pitch and vane inclination from the bottom axially inserted into the conical silo bottom, said stirring member being so constructed and rotated about its own axis as to originate an upward motion of the material involved by its conical enveloping surface,

means being provided for ejecting and delivering the material, said means including an outlet port arranged laterally relative



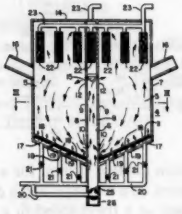
to said stirring member in a lateral enlargement of the silo in correspondence with the lower end of the conical silo bottom end.

4,185,926

SAFE-GEOMETRY PNEUMATIC NUCLEAR FUEL POWDER BLENDER

Ward L. Lyon, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 28, 1978, Ser. No. 882,037
Int. Cl.[2] B01F *13/02*
U.S. Cl. 366—101 **5 Claims**



1. A safe-geometry powdered nuclear fuel blender comprising:

a circular array of narrow vertical circumferentially spaced-apart blending chamber means;

a cylindrical shell coaxial with said array and containing neutron absorbing material in disposition between said blending chamber means;

filler means for introducing powdered nuclear fuel material into said blending chamber means;

an updraft spouting tube means extending vertically at the center of said circular array and having powder inlet and outlet openings into the several blending chamber means of such array at upper and lower regions thereof;

pneumatic means for effecting flow of gas upwardly through said updraft spouting tube means for inducing circulation of said powdered material through said blending chamber means via said inlet and outlet openings; and

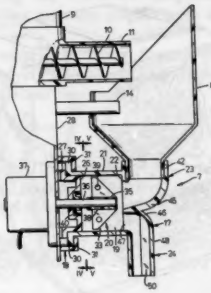
exit means for the blended powdered fuel material.

4,185,927

MIXER FOR RECONSTITUTING DEHYDRATED MASHED POTATOES

Raymond E. Uttech, Watertown, Wis., assignor to Karma Division of Brandt, Inc., Watertown, Wis.

Filed Oct. 23, 1978, Ser. No. 953,415
Int. Cl.[2] B01F *7/04, 15/02*
U.S. Cl. 366—131 **6 Claims**



1. Mixing apparatus by which dehydrated mashed potato material can be quickly combined with hot water to produce prepared mashed potatoes, said apparatus comprising:

A. means defining a cylindrical mixing chamber having its axis substantially horizontal and having axially opposite end walls, one of said end walls having a substantially flat inner surface and there being both an inlet port and an outlet port in said one of said end walls,

(1) said outlet port being wholly spaced below the level of said axis and extending down to the level of the bottom of the mixing chamber, and

(2) said inlet port extending downward from a level below that of the top of the mixing chamber to a level which is below said axis but is spaced above the top of the outlet port, so that a substantial portion of the area of the inlet port is near said axis;

B. an agitator coaxially rotatable in said chamber, said agitator having flat blades that extend edgewise along said axis and substantially radially from it;

C. means comprising a curved inlet duct for conducting water and dehydrated material downwardly into said inlet port; and

D. means comprising a curved outlet duct having an upper end portion communicated with said outlet port and located wholly below said axis, for conducting mixed water and dehydrated material downwardly away from said outlet port.

4,185,928

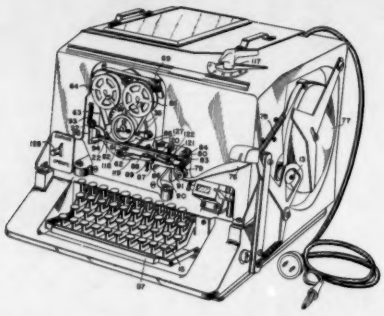
PRINTER FOR ELECTRIC CODING MACHINES

Howard L. Krum, Beverly Hills, Calif., and Rolf A. Thienemann, Chicago, Ill., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 15, 1944, Ser. No. 568,366
Int. Cl.[2] G09C *3/08*
U.S. Cl. 400—90 **13 Claims**

8. In a cryptographic machine having a keyboard, and coding circuits conditionable for encipher and decipher operation: a printing device, means connecting said device to the keyboard through the coding circuits in one direction for enciphering and in the opposite direction for deciphering, and for connecting said device directly to the keyboard for printing plain text; means to feed to said device a tape upon which characters are to be printed, including a friction drive rotatable shaft, tape feed members driven by the shaft, three toothed

wheels fixed on the shaft in abutting relation, a first one of said wheels having a continuous series of teeth, a second wheel adjacent thereto having two only diametrically opposite teeth higher than the teeth on the first wheel, and a third wheel adjacent the second having two equal groups of teeth with spaces equal to one tooth separating the groups and a first tooth in each group adjacent a said high tooth, a pawl slidably mounted to be engageable with any said toothed wheel to



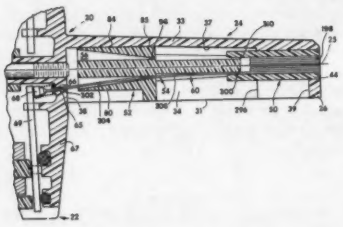
prevent rotation of the shaft while so engaged, the pawl being rockably mounted to be disengageable from a tooth of the first or the third wheel each time a character is printed to permit rotation of the shaft, means to move the pawl to engage the first wheel for decipher and plain text writing, to engage the third wheel for encipher and to engage the second wheel during non-printing operation of the machine, and means actuated to disengage the pawl each time a character is printed.

4,185,929

WIRE MATRIX PRINT HEAD ASSEMBLY

Donald G. Hebert, 9412 Cherry Hills La., San Ramon, Calif. 94583, assignor to Helmut Falk, Palo Alto and Donald G. Hebert, San Ramon, both of, Calif.

Filed Mar. 10, 1978, Ser. No. 885,186
Int. Cl.[2] B41J *3/12*
U.S. Cl. 400—124 **25 Claims**



8. A wire matrix print head assembly having a plurality of elongated wire members, arranged in a generally circular array and being movable between a retracted nonprint position and an extended print position, and a plurality of armature members arranged in a circular array, operably associated with the wire members to cause movement thereof from the retracted non-print position to the extended print position, and comprising:

an armature housing means for receiving and supporting the armature members and for receiving and supporting drive end portions of the wire members in operative association with the armature members;

an elongated wire housing means extending axially outwardly from the armature housing means and having a print end portion spaced forwardly of said armature housing means for receiving and slidably reciprocably supporting the wire members; and

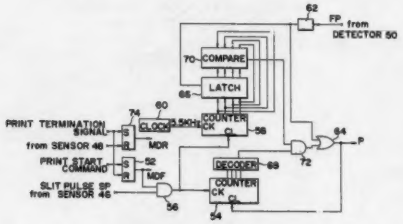
wire bearing and guide means mounted in said wire housing means and having a portion located radially inwardly of and a portion located radially outwardly of said wire members for providing a substantially continuous elongated guide and bearing passage for each wire member extending between said armature housing means and the print end portion of said wire housing means for providing a plurality of relatively long length open passage portions for enabling assembly of the wire members by continuous uninterrupted forward movement therethrough which are constructed and arranged to be in spaced non-contacting relationship with said wire members after assembly and during operation by the armature members from the retracted non-print position to the extended print position; and for providing a plurality of relatively short length axially spaced bearing means passage portions for slidably supporting each wire member at fixed axial spaced locations during operation by the armature members from the retracted non-print position to the extended print position.

4,185,930

PRINT POSITION CONTROL IN A PRINTER INCLUDING A PRINTER HEAD MOUNTED ON A TRAVELING CARRIAGE

Ikuo Umeda; Masahiko Aiba, both of Nara, and Kozo Kimura, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Jun. 23, 1978, Ser. No. 918,419
Claims priority, application Japan, Jun. 27, 1977, 52-76753
Int. Cl.[2] B41J *19/30, 25/22*
U.S. Cl. 400—320 **5 Claims**



1. A print position control system for a printer including a printer head mounted on a carriage, and a drive mechanism for driving said carriage at a fixed speed in a row direction, said print position control system comprising:

a pulse generation means for developing pulse signals in response to travel of said carriage;

a first counter means for counting said pulse signals developed from said pulse generation means;

means for developing a first control signal each time said first counter means counts a predetermined number of pulse signals;

detection means for developing a first character print command signal when said carriage reaches the first character print position;

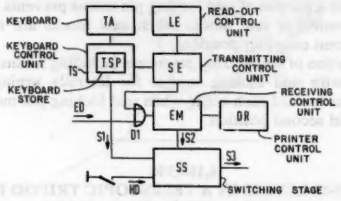
a second counter means for counting pulses indicative of a time interval from a time at which the last pulse signal is developed from said pulse generation means to a time at which the first character print command signal is developed from the detection means; and

means for developing print commands each time said time interval has passed after generation of said first control signal.

4,185,931
CIRCUIT ARRANGEMENT FOR DETERMINING THE POSITION OF A PRINTER CARRIAGE IN PRINTER DEVICES

Gerd J. Guenther, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 25, 1978, Ser. No. 899,870
Claims priority, application Fed. Rep. of Germany, May 6, 1977, 2720419
Int. Cl.[2] B41J *5/30*
U.S. Cl. 400—705 **7 Claims**

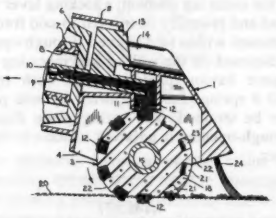


1. A circuit arrangement for determining the position of a printer carriage in printer devices wherein a keyboard is operable to produce advance characters which are to trigger advance of the printer carriage, and a keyboard control unit is connected to the keyboard and produces first control signals following each input of one of such advance characters, and wherein the keyboard control unit has a keyboard store for storing a plurality of such advance characters, and wherein a receiving device connected to the keyboard store produces second control signals following the reception of each advance character from the keyboard control unit or other source of advance characters, characterized in a switching stage (SS) being provided which is fed with the first control signals (S1) and the second control signals (S2) and having a counter stage (VZ) which, by means of the second control signals (S2), and taking into account the first control signals (S1) produces signals (S3) assigned to the position of the printer carriage.

4,185,932
FABRIC CLEANER

Robert A. Yonkers, Grandville, and Leonard A. Mattano, Grand Rapids, both of Mich., assignors to Bissell, Inc., Grand Rapids, Mich.

Filed Dec. 14, 1977, Ser. No. 860,383
Int. Cl.[2] H46B *5/02*
U.S. Cl. 401—21 **2 Claims**

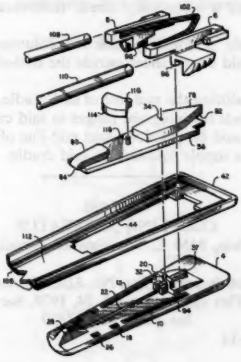


1. A cleaner for fabrics such as upholstery and the like, comprising:
(a) a core and a sleeve thereon which together form a roller,
(b) said sleeve being of synthetic open cell multiple pore sponge material,
(c) a plurality of discrete cavities disposed in the outer surface of the said roller sleeve and with said cavities opening outwardly of the sleeve surface and extending radially inwardly thereof,
(d) said cavities each including a skinned surface substantially covering the pores of said sponge material within said cavities and wherein each of said cavities is wider and deeper than the individual pores of said roller sleeve and wherein said cavities are spaced apart to form unskinned lands therebetween, and further wherein said cavities comprise means to force foam detergent onto the fabric in an application and removal action on discrete surface areas of the fabric as the roller progresses thereover,
(e) means mounting said roller for reciprocal movement over and in rolling pressure contact with a fabric to be cleaned,
(f) and means to supply a detergent foam to the top of said roller to successively fill the said cavities with said foam during said reciprocal movement.

4,185,933
FLAT, MULTI-ELEMENT WRITING INSTRUMENT

Nathan A. Zepell, 1359 Santa Teresita Dr., Santa Barbara, Calif. 93105

Filed May 2, 1977, Ser. No. 792,772
Int. Cl.[2] B43K *5/16, 24/04, 27/12*
U.S. Cl. 401—104 **20 Claims**



1. A writing instrument including an extendable writing element housed within a body, the instrument including a clip for holding the instrument in the clothing of the user, the improvement comprising:
means for supporting said clip on said body for pivotal movement of said clip about an axis transverse to the longitudinal axis of said body and fixing said clip against longitudinal movement relative to said body,
an elongated slot in the body of the instrument,
a glide element having a portion received within the elongated slot and a portion received within the instrument for controlling the extension of the writing element from the body of the writing instrument, the guide element including a manually actuated portion in slideable engagement with the external surface of the body and a locking portion received under the clip when the glide element causes the writing element to be extended from the body of the instrument in a writing position,
the clip including catch means on the underside of the clip externally of the body to hold the locking portion of the glide element and to thereby hold the writing element in a writing position, the catch means releasing the glide element portion when the clip is pivoted on said axis, and
means urging the writing element into a retracted position within the body of the instrument whereby when the clip is pivoted the writing member is automatically retracted into the body of the instrument.

4,185,934

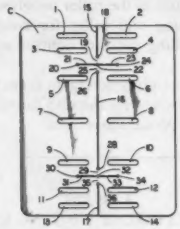
FILLER CRADLE FOR LOOSELEAF RINGBINDERS

Hollis C. Hodson, P.O. Box 114, Amo, Ind. 46103

Filed May 18, 1978, Ser. No. 903,531

Int. Cl.[2] B42F *7/00*

U.S. Cl. 402—80 L **4 Claims**



1. A cradle for collecting looseleaf filler butts within an open ringbinder during ringbinder closure, which said cradle is made by a method comprising the steps of:

a. sectioning out, from bulk sheet material having suitable properties, a selectively sized, flat, rectangular cradle sheet;

b. selectively perforating matched columns of transverse slots in said cradle sheet astride the mid-strip of said cradle;

c. partially slitting the mid-line of said cradle, leaving conjugated bonds for integrant hinges in said cradle; and

d. creasing said hinges along said mid-line of said cradle for marking a supple fold-line on said cradle.

4,185,935

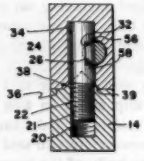
COUPLING APPARATUS

John W. Bierlein, 9450 E. Townline Rd., Frankenmuth, Mich. 48734

Continuation-in-part of Ser. No. 819,780, Aug. 25, 1977, abandoned. This application Jul. 24, 1978, Ser. No. 927,379

Int. Cl.[2] F16B *17/00*

U.S. Cl. 403—14 **10 Claims**



1. Coupling apparatus comprising:

a first longitudinally extending coupling member including a laterally outwardly opening, projection receiving, alignment recess having laterally inwardly converging sidewall surfaces;

a second coupling member having a laterally outwardly extending alignment projection laterally movable into and out of said recess, said projection including laterally outwardly converging sidewall surfaces which are complemental to said inwardly projecting sidewall surfaces;

said coupling members being relatively laterally movable between laterally spaced apart positions and adjacent coupling positions in which said outwardly converging sidewall surfaces abut said inwardly converging sidewall surfaces;

one of said first and second coupling members including a laterally extending locking tongue projecting laterally outwardly away from one of said laterally inwardly converging wall surfaces and said laterally outwardly converging wall surfaces;

the other of said first and second coupling members including a laterally extending locking recess on the other of said inwardly converging wall surfaces and said outwardly converging wall surfaces for laterally receiving said locking tongue means when said coupling members are in said coupling positions; and

locking pin means, mounted on said other of said first and second coupling members for movement between a first position in which said locking tongue can laterally move into and out of said locking recess and a second position in which a portion of said locking pin means prevents lateral separation of said blocks when said blocks are in said adjacent coupling positions;

said portion of said locking pin means including means reacting with said locking tongue for laterally urging said blocks toward each other when said locking pin means is in said second position.

4,185,936

LOCKING DEVICE IN A TELESCOPIC TRIPOD LEG ASSEMBLY

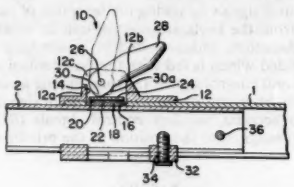
Shoichiro Takahashi, Yokohama, Japan, assignor to Kenlock Corporation, Yokohama, Japan

Filed Jul. 28, 1978, Ser. No. 928,782

Claims priority, application Japan, Aug. 5, 1977, 52/104325[U]

Int. Cl.[2] F16B *7/18*

U.S. Cl. 403—104 **3 Claims**



1. A locking device in a telescopic tripod leg assembly comprising at least two inner and outer leg elements, for releasably fixing one of the leg elements relative to the other in an extended position of said tripod leg assembly, comprising an opening formed in the wall of said outer leg element; a frame fixedly secured to said outer leg element and having an opening forming an aligned through-opening together with said opening of the outer leg element; a locking lever having a cam at its one end and pivotally connected to said frame so that the cam is positioned within said aligned through-opening; a pressure piece disposed on the wall of said inner leg element, said pressure piece having projections at both opposed sides thereof; and a spring piece supported by said projections so that it may be strained, said spring piece disposed in said aligned through-opening in adjacent relation to the cam of said locking lever.

4,185,937

FASTENING DEVICE WITH POSITIVE LOCKING MEANS

Bernard J. Anderson, Danvers, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Aug. 25, 1978, Ser. No. 936,976

Int. Cl.[2] F16B *39/00*

U.S. Cl. 403—316 **12 Claims**

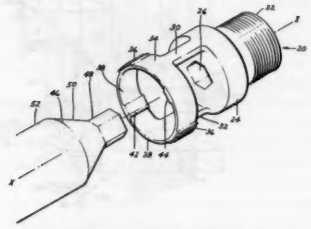
8. The invention comprising:

first and second generally cylindrical shafts abutting one another at an interface;

a fastening device having a cylindrical threaded portion and

a headed portion, said threaded portion adapted to engage one of said shafts and said headed portion adapted to engage the other of said shafts to maintain said shafts in abutting relationship at said interface; and

an elastically deformable annular ring disposed generally co-axial with said cylindrical threaded portion and connected to said headed portion said annular ring including a radially facing surface having locking elements disposed



thereon, said annular ring having a first contour wherein said locking elements engage one of said shafts in a locking relationship to prevent rotation of said annular ring and said fastening device, said annular ring deformable to a second contour, said locking elements movable radially in response to said deformation of said ring so as to disengage said elements from said one of said shafts and permit rotation of said annular ring and said fastening device during installation and removal of said fastening device.

4,185,938

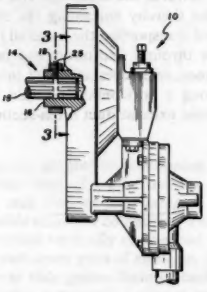
LOCKING COLLAR FOR POWER TAKE-OFF MOUNTED SHAFTS

Ramon Pareja, Edina, Minn., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Nov. 20, 1978, Ser. No. 961,993

Int. Cl.² B25G *3/28*

U.S. Cl. 403—359 **4 Claims**



1. Means for releasably coupling together spline shafts and wherein the mating splined shafts include telescoping inner shaft and outer housing portions respectively and wherein said outer housing portion has a certain predetermined outer diameter, and with said outer housing portion having a radially directed threaded bore extending therethrough, said coupling means comprising:

(a) a locking collar having first and second radially extending threaded bores formed therethrough, and with the pitch of the threads of said first bore having a predetermined value, and matching that of the bore within said housing portion, and with the inner diameter of said collar being greater than the outer diameter of said housing portion by an amount greater than said predetermined pitch value, and wherein said radial bores are angularly disposed at an angle of less than 180°;

(b) first set screw means within said first bore and having a length sufficient to pass through and occupy said first collar bore and said housing portion bore;

(c) second set screw means within said second collar bore and adapted to be lockingly engaged against the outer diameter of said housing portion so as to cause said locking collar to become stressed;

(d) the arrangement being such that when said first set screw is disposed within said first bore and housing portion and making contact with the surface of said shaft portion, the force of said second set screw against said locking collar cams said first set screw against the surface of said shaft portion and the resultant stress in said collar displaces the axis of said first bore and housing portion bore respectively.

4,185,939

GROUND COVERING SLAB

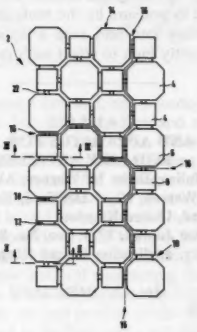
Günter Barth, Am Schwalbenloch 7, D-7500 Karlsruhe 41, and Fritz von Langsdorff, Blumenstrasse 12, D-7551 Förch, both of Fed. Rep. of Germany

Filed Jul. 11, 1978, Ser. No. 923,581

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1977, 2732452

Int. Cl.² E01C *5/00*

U.S. Cl. 404—38 **13 Claims**



1. A ground covering slab comprising first and second kinds of adjacent spaced, individual stones arranged in a pattern having first and second longitudinal edges, said first and second kinds of stones having first and second surface areas respectively; and first and second types of connecting elements located within the spaces between adjacent stones and interconnecting said stones to each other, the strength of said first type of connecting elements being greater than that of said second type of connecting elements, said connecting elements forming elongated rupture zones extending non-rectilinearly between said first and second longitudinal edges thereby stiffening said slab.

4,185,940

METHOD AND SYSTEM FOR SUPPORTING A ROOF

Klaus Spies, Oberholte 29, 46 Dortmund, Fed. Rep. of Germany

Filed Nov. 8, 1977, Ser. No. 850,096

Int. Cl.² E21D *23/04*

U.S. Cl. 405—288 **37 Claims**

1. A method of supporting a roof, particularly a roof of an underground excavation such as a mine, comprising the steps of providing a hollow prop casing composed of at least two telescopable sections; erecting the prop casing and telescoping it apart until it bears upon the roof to be supported; arresting

the sections of the prop casing in the telescoped-apart position; filling the prop casing with a hardenable substance in flowable condition so that said substance, upon hardening thereof, forms a solid column able to support said roof; and confining between a lower end of the prop casing and a floor against which the

lower end bears, a mass of the hardenable substance which is formed with an internal void and with an inlet to the same so that, when the prop casing and column are later to be removed while subjected to pressure by the roof, said mass can be ruptured by admitting into said void a liquid under a pressure which is sufficiently high to effect such rupturing.

4,185,941

METHOD AND APPARATUS FOR ASSEMBLING ROD-LIKE ARTICLES

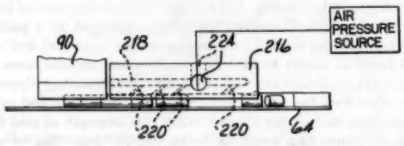
Desmond W. Molins; Brian H. Warner; Alan G. Claydon, and Anthony W. Watson, all of Deptford, England, assignors to Molins Limited, United Kingdom

Filed Jul. 12, 1977, Ser. No. 815,199

Claims priority, application United Kingdom, Jul. 22, 1976, 30533/76

Int. Cl.[2] B65G *51/02*

U.S. Cl. 406—77 **15 Claims**



1. Apparatus for assembling rod-like articles comprising conveyor means for conveying a stream of rod-like articles in an endwise direction; retarding means for retarding selected articles relative to said stream to form spaced groups of articles; guide means extending along and spaced above said conveyor means to define a path for said stream along said conveyor means upstream of said retarding means; and means for supplying an air stream from said guide means having a component of movement along said path in the conveying direction of the rod-like articles towards the retarding means, said means for supplying an air stream includes means for supplying said stream as a series of intermittent pulses, whereby articles are urged by said air stream towards the retarding means to ensure that the articles of each group are in abutting relationship.

4,185,942

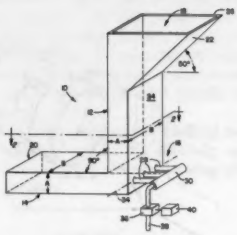
MATERIAL TRANSFER SYSTEM

Bazan, John A., Nutley, N.J., assignor to The United States of America as represented by the Administrator of the United States Environmental Protection Agency, Washington, D.C.

Filed Oct. 6, 1977, Ser. No. 840,183

Int. Cl.[2] B65G *53/42*

U.S. Cl. 406—85 **8 Claims**



1. A material transfer system for transferring particulate material between a first material container and a second material container comprising:

a downcomer duct having an upper end thereof adapted to communicate with a first material container for receiving and storing particulate material;

an exhaust duct aligned along the horizontal and having a rectangular cross-section with one end communicating with said downcomer duct for receiving the material and an outlet end for discharging the material into a second material container, said rectangular cross-section having an altitude dimension and a base dimension with the ratio of said altitude dimension to said base dimension being approximately equal to 0.58; and

a plurality of gas flow tubes each having an open end thereof communicating with the interior of said exhaust duct opposite from the discharge end, each of said tubes adapted to direct pulsed gas flows at a selected pulse repetition rate towards the discharge end of said exhaust duct, each pulse thereby entraining the material in said exhaust duct and transporting the material in the direction of the gas flow through said outlet end into the second material container, said tubes arranged in a spaced apart relationship along a horizontal line, said line being the medial line of said exhaust duct cross-section.

4,185,943

DRILLING AND TAPPING MACHINING APPARATUS

Charles F. Hautau, Oxford, Ohio, assignor to Ameco Corporation, Menomonee Falls, Wis.

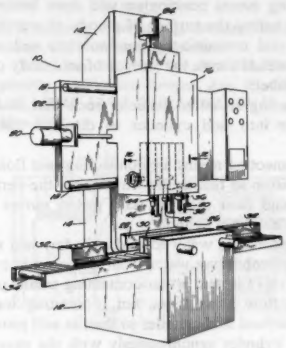
Filed Apr. 24, 1978, Ser. No. 899,687

Int. Cl.[2] B23B *39/16*

U.S. Cl. 408—46 **3 Claims**

1. In multiple tool machining apparatus having a frame supporting first, second and third working tools for sequential application to a workpiece, the improvement comprising means for independently supporting each of said work tools, means for independently feeding said tools, means for rotating said tools and adjustment means for simultaneously adjustable spacing said second and third work tools relative to the first

work tool to simultaneously move said third tool at twice the rate and distance moved by said second tool from said first tool



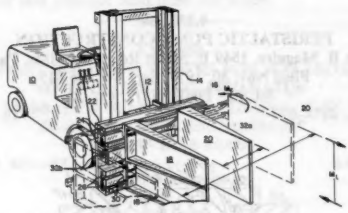
so that the centers of said first and third tools are always equidistant from said second tool.

4,185,944

SLIDE STRUCTURE FOR PARALLEL ARM CLAMPS AND THE LIKE

Richard D. Seaberg, Vancouver, Wash., assignor to Cascade Corporation, Portland, Oreg.

Filed Jun. 29, 1978, Ser. No. 920,455
Int. Cl.[2] B66F *9/18*
U.S. Cl. 414—621 **15 Claims**



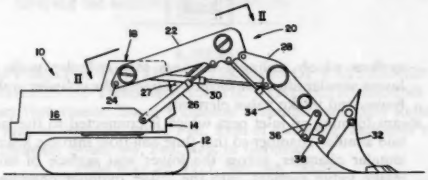
11. A slide structure adapted to be mounted on an elevatable load carriage at the front of a lift truck for operating transversely openable and closable load arms of a load-handling attachment, said slide structure comprising a slide guide frame, adapted to be mounted vertically on the load carriage, having respective upper and lower pairs of elongate, parallel, vertically-spaced transverse slide guides thereon, each of said pairs of slide guides mounting a respective pair of mutually-adjacent, elongate, parallel, vertically-spaced slide members longitudinally movable alternately toward or away from one another in a mutually-overlapping longitudinal relationship, each of said slide members having a longitudinal rear portion movably mounted within a respective one of said guides and a longitudinal front portion external of the respective guide fixedly connected to said rear portion so as to move longitudinally in unison therewith, each of said longitudinal front portions extending longitudinally along the majority of the length of the respective slide member and including a first elongate section protruding forwardly from the respective guide and extending longitudinally along the respective slide member and a second section fixedly connected to said first section at one end of said front portion and also protruding forwardly from the respective guide, said second section having a vertical dimension greater than that of said first section, said second sections of said slide members having surfaces for the attachment of load arms thereto and being located at opposite ends of each of said pairs of slide members such that the second sections of the upper slide members of the respective pairs are in vertical alignment with each other and the second sections of the lower slide members of the respective pairs are in vertical alignment with each other, said second sections of each respective pair of slide members protruding vertically toward the other slide member of the respective pair, the slide members of each respective pair being in such close vertical proximity to each other that the second sections of the respective pair overlap one another vertically, the first and second sections respectively of all of said slide members all intersecting a common longitudinal vertical plane.

4,185,945

CYLINDER MOUNTING

Stephen H. Gill, Mentor, Ohio, assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 7, 1977, Ser. No. 813,730
Int. Cl.[2] E02F *3/38*
U.S. Cl. 414—727 **2 Claims**



2. A linkage comprising a first link, and a second link pivotally connected to said first link, said first and second links comprising spaced parallel rails and cross tubes connecting said rails, hydraulic cylinder means for pivoting the second link with respect to the first link, flat tab means disposed on a cross tube of said first link and having a pivot bore provided therein, a ball disposed in said pivot bore and having flat faces provided thereon at the ends of said bore, a bifurcated end provided on said hydraulic cylinder and including end portions embracing the tab means and ball and having flat faces provided thereon arranged to abut the faces on the ball, coaxial pin bore means provided in the end portion of the bifurcated hydraulic cylinder end and in the ball, and a pin disposed in the ball and in the bifurcated end of the hydraulic cylinder embracing the ball, whereby said hydraulic cylinder can pivot with respect to the first link about the center of the ball as the second link pivots with respect to the first link and the axis of the pin does not intersect the link rails, and wherein the tab means is substantially coplanar with a diameter of the cross tube of the first link and in line with a backing member forming an integral part of said cross tube along a diameter thereof for strengthening said cross tube.

4,185,946

RESILIENT INTAKE AND EXHAUST VALVE

Ronald H. Mitchell, 903 Sandifer, Longview, Tex. 75601

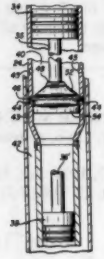
Filed Mar. 7, 1978, Ser. No. 884,133
Int. Cl.[2] F04B *3/00*
U.S. Cl. 417—254 **8 Claims**

1. A downhole pump assembly having spaced pistons connected together by a connecting rod, a cylinder within which said pistons reciprocate, a valve assembly having a bushing; said bushing has an axial passageway formed therethrough which sealingly receives said connecting rod in slidable relationship therethrough, and divides the cylinder into upper and lower cylinder chambers;

a frame by which said bushing is supported from said cylinder, an exhaust port formed through said frame;

a resilient exhaust valve element having a lower, circumferentially extending end portion attached to said frame, and an upper circumferentially extending seal surface which sealingly engages a marginal length of said bushing such that an exhaust chamber is formed between the bushing, frame, and exhaust valve element with said exhaust port being in communication with said chamber;

a resilient intake valve element having an upper circumferentially extending end portion affixed to the other side of the frame with said exhaust port being located inwardly thereof; and, a lower circumferentially extending seal



surface which sealingly engages said cylinder wall; a lower annular chamber formed between the cylinder wall, frame, and intake valve element;

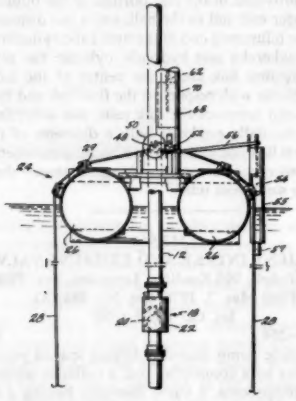
means forming an inlet port which is connected to the last said annular chamber so that fluid can flow into the lower annular chamber, across the lower seal surface of said intake valve element, into the lower cylinder chamber, through the exhaust port of the frame, into the upper annular chamber, and across the upper seal surface where the fluid can then flow from the pump assembly and to the surface of the ground.

4,185,947

WAVE-ACTUATED ENERGY TRANSFER APPARATUS

F. C. Menk, 506 E. Beverley St., Staunton, Va. 24401

Filed Dec. 28, 1977, Ser. No. 865,339
Int. Cl.[2] F03B *13/12*
U.S. Cl. 417—333 20 Claims



1. Wave-actuated energy transfer apparatus comprising:

a hollow cylinder having an open bottom and a top with an opening;

water-containing means connected to said cylinder opening;

means for supporting said cylinder and said containing means so that said cylinder and said containing means remain substantially stable with respect to the waves, said supporting means positioning said open bottom of said cylinder below the surface of a body of water and positioning said containing means so that said containing means extends above the surface of said body of water;

a float member;

a piston having an outer diameter such that said piston is insertable into said cylinder to displace fluid located therein;

flexible connecting means for connecting said float member to said piston so that as the waves alter the vertical position of said float member, said piston moves synchronously within said cylinder;

means for admitting water to said cylinder, said means for admitting prohibiting water from leaving said cylinder;

a one-way valve in said water-containing means permitting water to flow away from, but prohibiting water from flowing toward said cylinder so that, as said piston moves into said cylinder synchronously with the movement of said float member, said piston forces water into said water-containing means, but as said piston motion reverses, the water remains in said water containing means; and

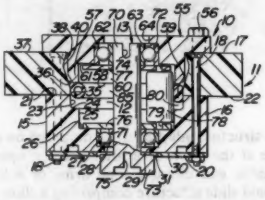
means for controlling the length of said connecting means between said float member and said piston so that the range of motion of said piston does not change as the average level of said body of water changes.

4,185,948

PERISTALTIC PUMP CONSTRUCTION

Stephen B. Maguire, 1549 E. Street Rd., Glen Mills, Pa. 19342

Filed Nov. 30, 1977, Ser. No. 855,815
Int. Cl.[2] F04B *43/12, 45/12*
U.S. Cl. 417—477 10 Claims

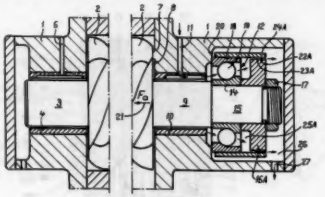


1. A peristaltic pump construction comprising a body part having a recess extending from one body side into said body part and bounded by a generally cylindrical internal side wall having a generally circular cross-section, eccentric roller means mounted in said recess for rotation about the axis of and in spaced relation within said internal side wall, passage means extending outwardly through said internal side wall and opening from said body part, a resiliently collapsible conduit removably extending about said roller means in the space between the latter and said internal side wall and having end portions extending outwardly through said passage means, said conduit being substantially collapsed in the space between said roller means and internal side wall for peristaltic action on roller means rotation, a side member removably secured across said recess, and a projection on said side member entering into the space between said roller means and internal side wall for engaging said conduit in said space.

4,185,949
SCREW COMPRESSOR WITH BEARING UNLOADING MEANS

Knut A. L. Lundberg, Norrkoping, Sweden, assignor to Stal Refrigeration AB, Norrkoping, Sweden

Filed Jan. 16, 1978, Ser. No. 869,701
Claims priority, application Sweden, Jan. 20, 1977, 7700571
Int. Cl.[2] F04C *17/12, 29/00;* F16C *19/10, 21/00*
U.S. Cl. 418—203 4 Claims

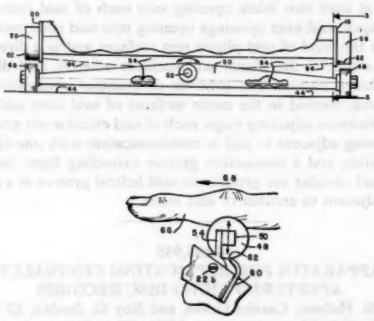


1. In a screw compressor, the combination of a housing, a rotor shaft rotatably journalled in the housing with a radial clearance, an antifriction bearing through which an axial force is transmitted from the rotor shaft to the housing, said bearing including first and second bearing rings and roll bodies located between the two bearing rings, the first bearing ring being mounted on the rotor shaft, the second bearing ring being supported in the axial direction by the housing and being radially movable relative to the housing, a piston mounted on the shaft in concentric relation thereto, and means for conducting a fluid under pressure to said piston to decrease said axial force transmitted from the rotor shaft to the housing, the combination being characterized by a surface which is stationary relative to the second bearing ring and which cooperates with said piston to form a narrow passage for allowing restricted discharge of said pressure fluid from the piston.

4,185,950
SUPPORT ROLLER SCRAPERS FOR WALLBOARD MASTIC APPLYING APPARATUS

Eric P. Lindskog, 258 S. Loraine Ave., Glendora, Calif. 91740

Filed Sep. 21, 1978, Ser. No. 944,397
Int. Cl.[2] B28B *19/00*
U.S. Cl. 425—87 4 Claims



1. An apparatus for applying a layer of mastic over plaster board joints of the type having a mastic reservoir for delivering mastic through a slot and a trailing blade adapted to trowel the mastic into a desired layer, the apparatus having a slideable support adjacent each end of the blade and a third support at its leading end, said third support comprising an axle pivoted to the reservoir for movement about an axis substantially parallel to the board, and a roller at each end thereof engageable with the board, whereby the slideable supports and the rollers may move in contact with a warped surface, as permitted by the axle pivot, the improvements, in combination comprising;

(a) a scraper for each roller for removing mastic from the peripheral surface thereof,

(b) each scraper being spaced from its associated roller and out of contact therewith during normal movement of the apparatus across the board,

(c) each roller being subject to accumulation of mastic on the periphery thereof which effects non-uniform troweling of the mastic,

(d) each scraper being spaced from its associated roller, and within the pivotal limit of the axle, such that the axle may be pivoted and engage a roller with a scraper,

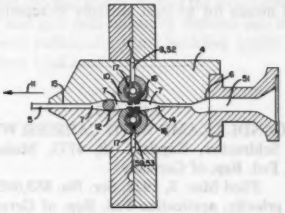
(e) each scraper also being affixed to the reservoir at a position thereon such that a portion of the roller is accessible to a hand of an operator for rotating same,

(f) the construction and arrangement being such that when accumulation of mastic on a roller occurs, the apparatus may be removed from the board and a portion of the hand of the operator moved across and in contact with the roller periphery, moving the axle about its pivot and the roller into rotating contact with the scraper, thereby scraping the accumulation therefrom.

4,185,951
APPARATUS FOR THE EXTRUSION OF PATTERNED SHEETS OF THERMOPLASTIC SYNTHETIC RESINS

Kurt Webermeier, Bonn; Waldemar Wissinger, and Otto Rulle, both of Siegburg, all of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Fed. Rep. of Germany

Filed May 10, 1977, Ser. No. 795,383
Claims priority, application Fed. Rep. of Germany, May 19, 1976, 2622289
Int. Cl.[2] B29F *3/12*
U.S. Cl. 425—133.5 13 Claims



1. An apparatus for the extrusion of patterned sheets of thermoplastic synthetic resins of a transparent basic synthetic resin material combined with at least one differently colored secondary synthetic resin material, which comprises:

(a) an extrusion die having a die channel for the extrusion of said thermoplastic synthetic resins, wherein said thermoplastic synthetic resins of a transparent basic synthetic resin material combined with at least one differently colored secondary synthetic resin material are adapted to flow through said die channel in a stream in an extrusion flow direction,

(b) feeding means for feeding said transparent basic resin material and said at least one differently colored secondary synthetic resin material to said die channel, whereby said transparent basic resin material combined with said at least one differently colored secondary synthetic resin material passes through said die channel in a stream, and

(c) means for causing partial streams of said stream of said thermoplastic synthetic resins of a transparent basic synthetic resin material combined with at least one differently colored secondary synthetic resin material to flow at an angle to the extrusion flow direction in said die channel

without mixing the entirety of said stream, said means comprising at least one movable element extending into the flow cross section through which said stream passes in said die channel of the extrusion die, said at least one movable element being formed with perforations for allowing the materials to pass therethrough, whereby sheets having patterns which are irregular and free of orientation are formed.

4,185,952

MOULDING MACHINES

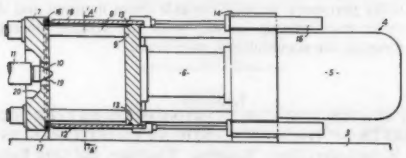
Malcolm Hewitt, Aldridge, England, assignor to British Industrial Plastics Ltd., Manchester, England

Filed Aug. 16, 1978, Ser. No. 934,112

Claims priority, application United Kingdom, Aug. 24, 1977, 35478/77

Int. Cl.[2] B29F *1/06*

U.S. Cl. 425—149 **8 Claims**



1. An injection moulding machine having a fixed and a moving tool portion, a shroud mounted for sliding movement around and in sealing relation to one of said portions towards and into sealing engagement with the other portion so as to define with the portions a substantially closed chamber around a moulding tool associated with said portions, together with means operable to urge said shroud into said sealing engagement and means for at least partially evacuating the closed chamber.

4,185,953

CANDLE LAMP WITH CARRIER WICK

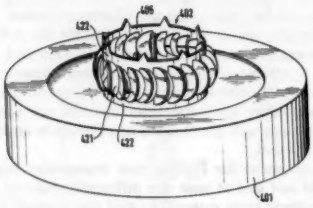
Hans L. Schirneker, Engelslit 10, 4773, Mohnesee-Vollinghausen, Fed. Rep. of Germany

Filed Mar. 3, 1978, Ser. No. 883,095

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1977, 2709170; Aug. 20, 1977, 2737652; Sep. 17, 1977, 2742017

Int. Cl.[2] F23D *3/16*

U.S. Cl. 431—291 **17 Claims**



1. In a wick lamp, a wick carrier adapted to float on liquid fuel and retaining at least one wick which is to be partly immersed in said fuel; a bladed rotor mounted on said wick carrier and arranged to be axially or radially impacted in use by the thermal airflow of each said wick when lighted so as to rotate said wick carrier.

4,185,954

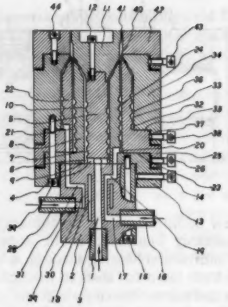
DIE FOR EXTRUDING TUBES COMPOSED OF A PLURALITY OF LAYERS

Kenkichi Murakami, Osaka, and Yoshiharu Kikuzawa, Takarazuka, both of Japan, assignors to Kabushiki Kaisha Plastic Kogaku Kenkyusho, Osaka, Japan

Filed Aug. 23, 1977, Ser. No. 827,014

Int. Cl.[2] B29D *23/04*

U.S. Cl. 425—462 **1 Claim**



1. A die for extruding a tube composed of a plurality of layers said die comprising:

(a) a central core having a helical groove on the outer surface thereof;

(b) at least two thickness adjusting rings surrounding the core and concentric therewith, each of said thickness adjusting rings having a planar seat surface and a helical groove on the outer surface thereof, the inner of said at least two thickness adjusting rings being fixed to said core at the planar seat surface thereof and a second of said at least two thickness adjusting rings being fixed to the inner thickness adjusting ring at the planar seat surface of the second thickness adjusting ring;

(c) resin passages formed between the helical groove in the outer surface of said core and the inner surface of the adjacent thickness adjusting ring and between the helical groove on the outer surface of each of said thickness adjusting ring and the inner surface of the adjacent thickness adjusting ring; and

(d) at least two inlets opening into each of said resin passages, said inlet openings opening into said resin passages at the level of said planar seat surfaces and in a direction parallel to the planar seat surfaces wherein said die includes circular arc grooves of constant cross-sectional area, formed in the outer surfaces of said core and said thickness adjusting rings, each of said circular arc grooves being adjacent to and in communication with one of said inlets; and a connection groove extending from each of said circular arc grooves to said helical groove at a point adjacent to another of said inlets.

4,185,955

APPARATUS FOR REPLICATING CENTRALLY APERTURED VIDEO DISC RECORDS

John R. Holmes, Garden Grove, and Roy G. Jordan, El Toro, both of Calif., assignors to MCA Disco-Vision, Inc., Los Angeles, Calif.

Division of Ser. No. 847,367, Oct. 31, 1977. This application Jun. 26, 1978, Ser. No. 918,894

Int. Cl.[2] B29F *1/00*; B29C *1/00, 1/14*

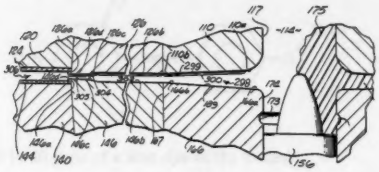
U.S. Cl. 425—542 **2 Claims**

1. In apparatus, for injection molding an article having a central aperture, having an injection nozzle for injecting a molten mixture into an annular cavity of uniform thickness formed by a first mold half and a second mold half, said injec-

tion gate being positioned intermediate the injection nozzle and the cavity, an injection gate comprising:

a sprue passage of substantially circular cross-section and having a first end and a second end, and said first end being adapted to contact the injection nozzle and to receive a molten mixture exciting the injection nozzle;

an annular shaped gate passage having a first end and a second end, and being formed by a plurality of concentric annular shaped sections positioned intermediate said second end of said sprue passage and said cavity;



each of said sections having a different average thickness for regulating the pressure of the molten mixture as the mixture passes therethrough prior to entering the cavity; and

said first end of said gate passage having a greater thickness than the second end of said gate passage for providing restriction to the passage of the molten material through said gate passage and for achieving a minimum disturbance to material flow of the molten material as it flows through said gate passage.

4,185,956

GAS PERMEABLE STRUCTURAL PART

Hugo Balster, Beckum, Fed. Rep. of Germany, assignor to Readymix Cement Engineering GmbH & Co. KG, Ratingen, Fed. Rep. of Germany

Filed Feb. 22, 1978, Ser. No. 880,185

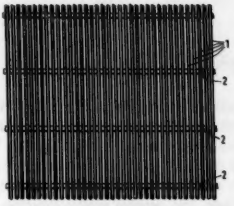
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1977, 2707953

Int. Cl.[2] F27D *5/00*

U.S. Cl. 432—258 **13 Claims**

1. A gas permeable structural part, particularly for insertion in burning and sintering devices, for withdrawal preferably of hot gases from a layer of granular material with a group of rods arranged parallel to one another and spaced from one another, the rods forming a gap respectively therebetween, the gap width being smaller than the diameter of the smallest material granule to be retained, comprising

means for holding granular material comprising a plurality of grid rods arranged parallel to one another and spaced from one another forming a gap respectively therebetween, said plurality of grid rods defining a face surface, the grid rods having a smallest possible cross-section and a smallest possible dimension in a direction perpendicular to the face surface of the plurality of grid rods, the grid rods with said cross-section and said extension solely



assuming without deformation the mechanical pressure of a material loading the grid rods,

a plurality of carrier rods supporting and engaging said grid rods, said carrier rods running approximately perpendicularly to said grid rods, said carrier rods are formed with a short width in a direction parallel to said face surface and having an extensively larger depth dimension in a direction perpendicular to said face surface,

said carrier rods being spaced apart at a distance from one another such that said carrier rods assume the total mechanical and thermal forces loading the structural part and subdivide said grid rods engaging thereon into individual sections with sufficiently short buckling length with respect to their total load.

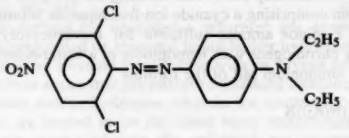
4,185,957

HEAT TRANSFER BLACK DYESTUFF B

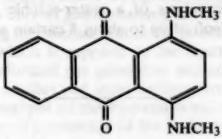
Jacques R. Magill, Milton, N.J., assignor to Crompton & Knowles Corporation, New York, N.Y.

Filed Dec. 17, 1976, Ser. No. 751,749
Int. Cl.[2] D06P *3/54;* C09B *27/00, 45/48;* C09D *11/02*
U.S. Cl. 8—2.5 R 17 Claims

1. A dyestuff composition composed of 20 to 80 parts of a brown dye of the formula



and 80 to 20 parts of a blue dye of the formula



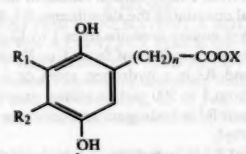
4,185,958

COMPOSITIONS BASED ON DIRECT DYESTUFFS CONTAINING A 2,5-DIHYDROXYPHENYLCARBOXYLIC ACID OR A SALT THEREOF

Andrée Bugaut, 7, rue des Abondances, 92100 Boulogne-Billancourt; Jean-Francois Grollier, 19, rue de Dantzig, 75015 Paris, and Jean-Jacques Vandenboosche, 6, rue Leon Richet, 93600 Aulnay-sous-Bois, all of France

Filed Aug. 18, 1978, Ser. No. 935,014
Claims priority, application Luxembourg, Aug. 19, 1977, 77995
Int. Cl.[2] A61K *7/13*
U.S. Cl. 8—10.1 23 Claims

1. A composition suitable for dyeing keratin fibres, comprising in an aqueous solution from about 0.005 to about 5% by weight of at least one direct dyestuff and from about 0.1 to about 10% by weight of an acid or salt of a compound having the formula:



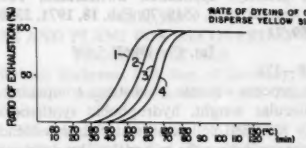
in which R_1 and R_2 are identical or different and denote hydrogen or a straight- or branched-chain alkyl group of 1 to 4 carbon atoms, X denotes hydrogen, an alkali metal, ammonium, or an alkanolamine radical, and n is 0 or an integer from 1 to 4.

4,185,959

METHOD FOR DYEING HYDROPHOBIC FIBER MATERIAL WITH DISPERSE DYE

Kunihiko Imada, Toyonaka; Katsumasa Ohtake, Kitakatsuragi; Taizo Ohshima, Tondabayashi, and Sanae Sakaguchi, Suita, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 23, 1976, Ser. No. 753,894
Claims priority, application Japan, Dec. 29, 1975, 50-157305
Int. Cl.[2] C09B *27/00;* D06P *1/00*
U.S. Cl. 8—26 12 Claims



1. A method for dyeing a hydrophobic fiber material, which comprises contacting said fiber material with a dye containing a combination of at least nine disperse dyes having different chemical structures from one another, wherein the combination comprises at least two primary-color dye compositions selected from the primary colors yellow, red, and blue, each of said selected primary-color dye compositions comprising at least one disperse dye.

4,185,960

SUPER-OXIDIZED SOLID SODIUM PERBORATE AND PROCESSES FOR ITS MANUFACTURE

Jean Brichard, Vilvoorde, and Jean-Claude Colery, Brussels, both of Belgium, assignors to Interox, Brussels, Belgium

Filed Apr. 10, 1978, Ser. No. 895,274
Claims priority, application Luxembourg, Apr. 8, 1977, 77095
Int. Cl. C01b *15/12;* C11d *3/39, 3/395*
U.S. Cl. 8—111 15 Claims

1. Superoxidized solid sodium perborate which contains more than 17 wt.% active oxgyen and less than 1.4 atoms hydrogen per active oxygen atom.

15. Bleaching process wherein superoxidized solid sodim perborate according to claim 1 is used as the bleaching agent.

4,185,961

POLYPYRROLIDONE FIBER TREATMENT

Mitchell Danzik, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 14, 1977, Ser. No. 851,081
Int. Cl.[2] D06M *13/34*
U.S. Cl. 8—115.5 9 Claims

1. A method for reducing the fibrillation of polypyrrolidone fibers which comprises contacting the fibers with an aqueous solution containing dimethyloldihydroxyethyleneurea and an acidic catalyst.

4,185,962
DYEING WITH ORGANIC DYESTUFFS DISPERSED IN AN ORGANIC LIQUID

Hans Gerber, Allschwil; Erwin Grueninger, Basel; Werner Koch, Oberwil, and Franz Somm, Riehen, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 263,955, Jun. 19, 1972, abandoned, which is a continuation-in-part of Ser. No. 240,276, Mar. 31, 1972, abandoned, Ser. No. 226,705, Feb. 16, 1972, abandoned, and Ser. No. 110,314, Jan. 27, 1971, abandoned. This application Jan. 30, 1975, Ser. No. 545,333

Claims priority, application Switzerland, Feb. 2, 1970, 1422/70; Apr. 30, 1970, 6519/70; Feb. 18, 1971, 2398/71; Apr. 7, 1971, 5059/71

Int. Cl.[2] D06P *5/04*

U.S. Cl. 8—171 12 Claims

1. In a process wherein a substrate comprising fibers of a high molecular weight, hydrophobic synthetic organic or artificially modified cellulosic material or a blend thereof is dyed by impregnating the material to be dyed with a liquor containing a dyestuff suitable for dyeing said material and fixing the dyestuff on the material, the improvement which comprises employing as the dye liquor a stable dispersion which is substantially free of water and consists essentially of

(x) a dyestuff suitable for dyeing the material to be dyed, dispersed in

(y) an organic liquid in which the dyestuff is not significantly soluble at room temperature and which has a boiling point in the range of about 80° to 170° C., and

(z) an alkyd resin dissolved in the organic liquid and having an acid number below 25 and free from rapid drying oils having an iodine number greater than 100,

said component (x) being present in an amount of about 0.01 to 4 weight percent of said liquor and said component (z) being present in an amount of 0.05 to 5 parts per part of component (x) and, after fixation of the dye, removing any unfixed dye and any alkyd resin remaining on the material.

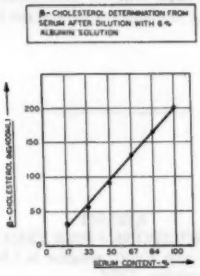
4,185,963
METHOD FOR DETERMINING LIPIDS IN BLOOD SERUM

Claus-Christian Heuck, Birkenweg 20, 6901 Wilhelmsfeld, Fed. Rep. of Germany (6901)

Filed Oct. 3, 1977, Ser. No. 839,091

Int. Cl.[2] G01N *33/16*

U.S. Cl. 23—230 B 14 Claims



1. Method for the direct determination of lipids in blood serum, which comprises extracting the pre-β-lipoprotein (very low density lipoprotein) and chylomicrons and α-lipoproteins (high density lipoproteins) from the serum by treatment of the serum with a polycation, and then measuring the lipid content of the β-lipoproteins (low density lipoproteins) in the serum.

4,185,964
LYSING REAGENT

Robert G. Lancaster, Baltimore, Md., assignor to Central Laboratories of Associated Maryland Pathologists, Ltd., Timonium, Md.

Filed Feb. 8, 1977, Ser. No. 766,731

Int. Cl.[2] G01N *33/16*

U.S. Cl. 23—230 B 22 Claims

1. A lysing reagent for lysing erythrocytes while leukocytes remain substantially intact and forming chromogens with hemoglobin comprising a cyanide ion-free aqueous solution containing a minor amount sufficient for erythrocytolysis and forming chromogens with hemoglobin of a water-soluble quaternary ammonium salt of the formula

$$R_1N(R_2)_3X$$

wherein R_1 is an alkyl having about 12 to 20 carbon atoms, each R_2 is the same or different and is lower alkyl or lower hydroxyalkyl, and X is an anion; and a minor amount sufficient to inhibit leukocytolysis of a water-soluble polycarboxylic acid, or salt thereof, of up to about 8 carbon atoms.

4,185,965
AMINE DERIVATIVES OF HYDROCARBYL LACTAM CARBOXYLIC ACIDS AS FUEL ADDITIVES

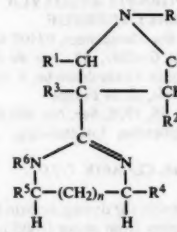
Raymond C. Schlicht, and William M. Cummings, both of Fishkill, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 27, 1977, Ser. No. 865,062

Int. Cl.[2] C10L *1/18, 1/22*

U.S. Cl. 44—63 19 Claims

1. A motor fuel composition comprising a mixture of hydrocarbons in the gasoline boiling range and an additive mixture including, in a concentration of from 0.001 to 0.1 weight percent, a substituted butyrolactam of the formula:



wherein R is a hydrocarbyl radical of from 1 to 12 carbon atoms, an N-mono- or N,N-di-hydrocarbyl substituted aminoalkyl radical wherein each hydrocarbyl moiety and said alkyl moiety contains from 1 to 12 carbon atoms, or an N-butyrolactam alkyl radical containing the substituents R^1, R^2 and R^3 and wherein said alkyl moiety contains from 1 to 12 carbon atoms;

R^1 is a hydrocarbon radical of from 1 to 20 carbon atoms;

each of R^2 and R^3 is a hydrogen atom or a hydrocarbyl radical of from 1 to 500 carbon atoms, provided that only one of R^2 and R^3 is hydrogen; and only one of R^2 and R^3 is hydrocarbyl;

each of R^4 and R^5 is hydrogen or a hydrocarbyl radical of from 1 to 25 carbon atoms;

R^6 is a hydrocarbyl radical of from 1 to 25 carbon atoms or an amino alkyl or poly (azaalkyl) radical;

n has a value of 0 to 1 inclusive; and

each of said hydrocarbyl substituents is unsubstituted or substituted.

4,185,966

METHOD FOR OPERATING A REFORMED-GAS GENERATOR

Wolfgang Frie, and Hans-Joachim Henkel, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 16, 1977, Ser. No. 778,215

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1976, 2614838

Int. Cl.[2] C10G *11/28;* C01B *2/14, 2/16*

U.S. Cl. 48—212 10 Claims

1. A method for operating a reformed gas generator, in which evaporated or atomized liquid higher hydrocarbons are reacted at an elevated temperature with an oxygen containing gas to form a soot free gas mixture containing methane, carbon monoxide and/or hydrogen, wherein the reactants to be converted are heated to an increased input temperature before they are conducted into the reformed gas generator; the throughput of the reactants is variable; and the air number λ of the oxygen containing gas is maintained between 0.05 and 0.2, in which the improvement comprises using as the oxygen containing gas only as gas containing the oxygen only in free form; supplying no external heat to the reformed gas generator except heat, which is supplied to the reactants before their input to the reformed gas generator; and controlling at least one of the air number and input temperature, as a function of changing throughput of the hydrocarbons, in such a manner that the degree of conversion of the hydrocarbons is between 60 and 95% whereby a reaction temperature of between 700° C. and 850° C. will adjust itself without a supply of a gas containing oxygen in bound form.

4,185,967

PROCESS FOR THE PRODUCTION OF METHANE-CONTAINING GASES AND CATALYST USED IN PROCESS

Costa Komodromos, London; Alan Williams, Shirley, and Norman Parkyns, London, all of England, assignors to British Gas Corporation, London, United Kingdom

Filed Feb. 15, 1978, Ser. No. 878,089

Claims priority, application United Kingdom, Feb. 18, 1977, 06908/77

Int. Cl.[2] B01J *21/04, 23/86;* C01B *2/16*

U.S. Cl. 48—214 A 14 Claims

1. A catalyst precursor for use in the steam reforming of hydrocarbons which consists of a calcined form of a coprecipitated basic carbonate of the empirical formula

$$Ni_aAl_bCr(III)_cCO_3(OH)_{16}xH_2O$$

wherein

a=4–6.4,

b/c=3–19:1,

2a+3b+3c=18 and

x=3.5–5.5; **and wherein at least** 55% by volume of the pores therein having a pore radius of from 12–120 A have a pore radius in the range of from 12–30 A.

4,185,968

METHOD FOR GENERATING A SOLDERABLE SURFACE ON A CONTACT PIECE OF SILVER AND FINELY DISTRIBUTED GRAPHITE PARTICLES

Rudolf Scherbaum, Regensburg; Bernhard Rothkegel, and Horst Schreiner, both of Nürnberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 3, 1977, Ser. No. 821,343

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1976, 2635928

Int. Cl.[2] B08B *7/00*

U.S. Cl. 51—316 7 Claims

1. A method for generating a graphite free solderable surface on a shaped part for electrical contacts which part consists of silver as a base metal and which part includes graphite particles, the graphite paticles not amounting to more than 5% by weight of said part and being finely and uniformly distributed therein, comprising sufficiently scouring the shaped part by simultaneously contacting said part with a liquid and scouring stones to produce a graphite free solderable surface on the shaped part.

4,185,969

PROCESS AND PLANT FOR RECOVERING WATER FROM MOIST GAS

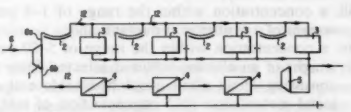
Wolfgang Bulang, Elchenau, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nuernberg AG, Munich, Fed. Rep. of Germany

Filed Aug. 28, 1978, Ser. No. 937,523

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1977, 2738874

Int. Cl.[2] B01D *53/04*

U.S. Cl. 55—31 9 Claims



1. A process for recovering water from moist gas which comprises a first reaction stage, which comprises the steps of:

(a) dividing a first flow of the moist gas into a first partial flow of gas and a second partial flow of gas;

(b) passing the first partial flow of gas through at least one absorber bed of a water-separating apparatus containing an absorbing agent, whereby moisture from the moist gas is absorbed by the absorbing agent and a moisture-containing absorber bed and an at least partially dried first partial flow of gas are obtained;

(c) discharging the at least partially dried first partial flow of gas from the water-separating apparatus;

(d) passing the second partial flow of gas through at least one heat-accumulator of the water-separating apparatus, whereby heat is transferred from the heat-accumulator to the second partial flow of gas and a de-heated heat-accumulator and a heated second partial flow of gas are obtained; and

(e) discharging the heated second partial flow of gas from the water-separating apparatus;

and a second reaction stage, which comprises the steps of:

(a') passing a second flow of the moist gas through at least one unit of the water-separating apparatus comprising a solar energy collector and the moisture-containing absorber bed, whereby the second gas flow is heated by heat-transfer from the solar energy collector to obtain a heated second gas flow and subsequently moisture is absorbed from the moisture-containing absorber bed and a heated second gas flow of increased moisture-content is obtained;

(b') subsequently passing the heated moisture-containing second gas flow through the deheated heat-accumulator, whereby heat is transferred to the heat-accumulator, and water is condensed on the accumulator surfaces and a second gas flow of decreased moisture-content and decreased temperature is obtained;

(c') discharging the second gas flow obtained in step (b') from the water-separating apparatus; and

(d') collecting the condensed water from the accumulator surfaces.

4,185,970

PAINT SPRAY BOOTH COMPOSITION

Ralph R. Dean, P.O. Box 1492, Fort Worth, Tex. 76117

Continuation of Ser. No. 776,116, Mar. 10, 1977, Pat. No. 4,125,476. This application May 22, 1978, Ser. No. 908,577
The portion of the term of this patent subsequent to Nov. 14, 1995, has been disclaimed.
Int. Cl.[2] B01D *47/00*; B08B *3/08*; C09D *9/00*; C23D *17/00*
U.S. Cl. 55—89 8 Claims

1. A method of removing paint from the air in a paint spray booth, comprising the steps of:

a. forming in a contacting system a dilute aqueous solution-suspension consisting essentially of water containing at least 2.5 percent by volume of a concentrated solution-suspension that includes:

i. at least 4.0 percent by weight of a water softener selected from the class consisting of a neutralized gluco heptonate salt and neutralized ethylenediaminetetraacetic acid salt;

ii. a concentration within the range of 4.0–25.0 percent by weight of a colloidal material that will pick up moisture and swell and remain stable in highly alkaline environments; said colloidal material being selected from the class consisting of glue, starch, Kiesulguhr, dextrin, casein and clay;

iii. a concentration within the range of 1–8 percent by weight of a synthetic surfactant; and

iv. a concentration within the range of 5–50 percent by weight of an alkaline material selected from the class consisting of an alkali metal hydroxide and an alkali metal metasilicate; said concentration of said alkaline material being sufficient to impart a pH above 10;

b. contacting at least a portion of the air in the paint spray booth with said dilute aqueous solution-suspension when painting is being done in said paint spray booth so as to strip the paint from the air being contacted with said aqueous solution-suspension; continuing said contacting when painting is being done over a predetermined interval of time of at least one month without adding additional concentrated solution-suspension;

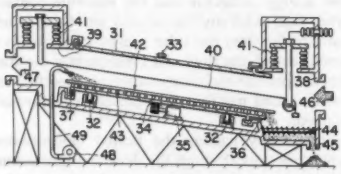
c. after said predetermined time interval, removing said dilute aqueous solution-suspension and accumulated paint and paint components from said system in a batch type operation and repeating step a. for trouble-free batch type operation that requires very little supervision.

4,185,971

ELECTROSTATIC PRECIPITATOR

Fumio Isahaya, Tokyo, Japan, assignor to Koyo Iron Works & Construction Co., Ltd., Tokyo, Japan

Filed Jun. 26, 1978, Ser. No. 919,324
Claims priority, application Japan, Jul. 14, 1977, 52-83526; Nov. 1, 1977, 52-130245; Apr. 21, 1978, 53-46645
Int. Cl.[2] B03C *3/10*
U.S. Cl. 55—113 9 Claims



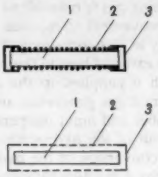
4. An electrostatic precipitator comprising a cylindrical electrode having a discharge electrode disposed along the central axis thereof and rotatably supported in an inclined or horizontal manner, means for rotating said precipitation electrode at a low speed, a dust removing device including a support having a plurality of plate-type scraping members aligned in the vicinity of the lower inner surface of said precipitation electrode, means for driving said support to move said scraping members in the direction of and in contact with the inner bottom surface of said precipitation electrode, and means for supplying liquid to the bottom inner surface of said precipitation electrode thereby moistening the dust which is being scraped.

4,185,972

ELECTRIC CHARGE HOLDING STRUCTURE FOR ELECTRETIZED AIR-FILTER MEDIUM

Sukekazu Nitta, Tokyo; Takuji Watanabe, Osaka, and Takashi Takahira, Yamato-Kohriyama, all of Japan, assignors to Nitta Belt Kabushiki Kaisha, Osaka, Japan

Filed Mar. 28, 1978, Ser. No. 891,124
Claims priority, application Japan, Mar. 28, 1977, 52-34887
Int. Cl.[2] B03C *3/02*
U.S. Cl. 55—155 5 Claims



1. An improved electretized filtering means comprising:

an electretized filter medium in a shape having opposite sides;

two covering means, each having a high electrical conductivity and an air permeability at least as great as the air permeability of said electretized filter means, and covering the two opposite sides of said electretized filter medium; and

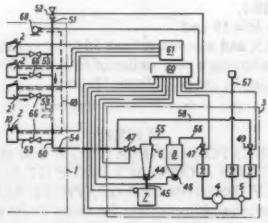
a shorting means electrically connecting the two opposite side covering means.

4,185,973

WASTE DISPOSAL SYSTEM

Colin A. Tester, Pinner, England, assignor to Metal Box Limited, Reading, England

Filed Mar. 29, 1978, Ser. No. 891,323
Claims priority, application United Kingdom, Apr. 1, 1977, 13780/77
Int. Cl.[2] B01D *51/00*
U.S. Cl. 55—212 9 Claims



1. In a waste disposal system comprising a plurality of shredders having sealably closable waste input aperture means, enclosed comminuting means associated therewith for comminuting waste received therethrough, and waste outlet means for the waste so comminuted; treatment apparatus for the comminuted waste; a common air inlet means independent of the shredders; ducting connecting said common air inlet means with said treatment apparatus; means connecting the waste

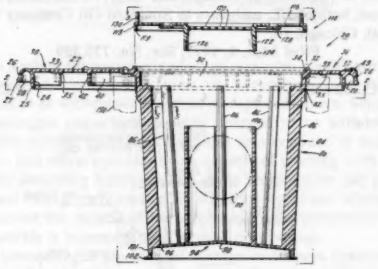
outlet means of each said shredder with said ducting, intermediate between said common air inlet means and treatment apparatus, in parallel with the means connecting the waste outlet means of the other shredder or shredders with said ducting; said treatment apparatus comprising air suction means for drawing transport air from said common inlet means at all times, and said comminuted waste from the shredders, and for drawing said air and waste through said ducting into the treatment apparatus, discharge valve means of the flow-regulating type arranged in the said means connecting the waste outlet means of each shredder with said ducting, and means for maintaining the discharge valve means partially closed so long as said waste input aperture means are open.

4,185,974

INTEGRAL FILTER CAGE AND LID FOR CANNISTER TYPE VACUUM CLEANER

Kenneth R. Hiester, Cogan Station, Pa., assignor to Shop-Vac Corporation, Williamsport, Pa.

Filed Dec. 15, 1977, Ser. No. 860,822
Int. Cl.[2] B01D *46/00*
U.S. Cl. 55—216 **27 Claims**



17. For use in a cannister type vacuum cleaner, an integral molded plastic assembly comprised of a lid for closing the open end of the tank of the vacuum cleaner and a filter support integrally formed with said lid;

said lid being in the form of a disc having opposite upper and lower surfaces; said lid having an annular periphery; said lid annular periphery being sealably attachable to a peripheral edge of a tank of a vacuum cleaner; said lid having and defining a first hole passing therethrough and located eccentrically thereon for providing communication through said lid;

a plurality of ribs defined on and extending across said lower surface of said lid for strengthening said lid; said ribs being oriented to extend generally from said first hole toward said periphery of said lid; said ribs being spaced closer to one another toward the side of said lid which defines a greater distance between said first hole and said periphery of said lid and being spaced farther apart toward the side of said lid which defines a lesser distance between said first hole and the periphery of said lid;

said filter support being integrally formed with and being supported thereby at said lower surface of said lid; said filter support being placed around said first hole in said lid, such that a filter carried by said filter support will, in combination with said filter support, block all flow of air through said lid hole except through the filter on said filter support;

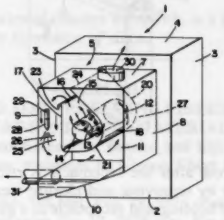
said filter support comprising a cage and said cage including a collar integrated with said lid and extending down into said tank from said lid lower surface, a plurality of cage ribs having one end integrated with said collar and extending down into said tank from said collar; said cage ribs having opposite ends; said cage having a bottom integrated to said cage rib opposite ends and said cage bottom closing off the free end of said cage, whereby a filter may be removably placed over said cage and surround said cage ribs annularly.

4,185,975

EXHAUST FOR AN OPENING INTO A COATER

Donald R. Scharf, Amherst, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Jul. 10, 1978, Ser. No. 923,420
Int. Cl.[2] B01D *47/06*
U.S. Cl. 55—238 **7 Claims**



1. An exhaust apparatus for an opening in a coater comprising:

a front wall and a rear wall, both having apertures therethrough combining to at least partially define a generally straight passage through said exhaust apparatus and adapted to lead to the interior of the coater through the exhaust apparatus and through the opening in the coater;

a side wall assembly attached to said front and rear walls to form a chamber around said apertures;

a collar means around said apertures and attached to said front and rear walls, and having holes therethrough to allow vapors issuing out of the opening in the coater to be drawn into said chamber in a predetermined manner;

baffle means in said chamber at least partially defining a generally downward then upward vapor flow passage from said holes in the collar means;

a spray nozzle positioned and arranged to spray a precipitant in a generally downward direction in said downward vapor flow passage and scrub vapors therein;

a drain at the lower portion of said chamber; and

an exhaust port for scrubbed vapors in said vapor flow chamber, elevated above said drain and downstream of said spray nozzle in said vapor flow passage.

4,185,976

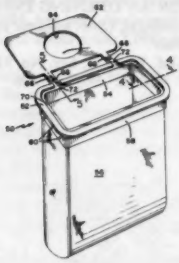
REUSABLE DUST BAG FOR VACUUM CLEANER

John Kosik, Stamford, and William P. Ritzau, Old Greenwich, both of Conn., assignors to Consolidated Foods Corporation, Old Greenwich, Conn.

Filed Mar. 13, 1978, Ser. No. 886,008
Int. Cl.[2] B01D *46/02*
U.S. Cl. 55—373 **6 Claims**

1. In a vacuum cleaner having a dust bag compartment with gasket means at one end and a removable cover member having an inlet conduit and further including a receptacle comprising, an air porous filter bag means positioned in said bag compartment of the vacuum cleaner, said bag means being open at one end and closed at the other end, said open end of said bag means having a dimension which is substantially the same as the cross-sectional dimension of said bag means when said bag means is fully distended, a substantially rigid rim having an opening of approximately the same dimension as said open end of said bag means, said rim including an outwardly extending flange engaging the gasket means of the vacuum cleaner, means for attaching said open end of said bag means to said rim so that said rim opening is substantially in alignment with said bag means, a closure member movably connected to said rim, said closure member normally closing said rim opening, and

said closure member having an inlet opening of a size to receive the inlet conduit of the cover member of the vacuum cleaner, whereby airborne foreign matter is introduced into said receptacle through the inlet conduit and may be discharged therefrom after the receptacle is removed from the vacuum cleaner by removing said closure member from said rim opening and holding said receptacle in a generally vertical position with said rim lowermost.

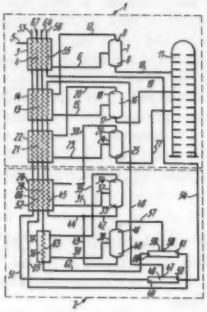


4,185,977

METHOD OF AND APPARATUS FOR PRODUCING HYDROGEN

Vasily I. Shirokov, ulitsa S. Kovalevskoi, 10/3, kv. 105, Leningrad; Gennady G. Maljutin, ulitsa Kirova, 4, kv. 2, Novopolotsk; Iliasaf I. Mishiev, kvartal 19th, 11, kv. 1, Sumgait, and Jury V. Saveliev, ulitsa Pionerskaya, 18, kv. 10, Baku, all of U.S.S.R.

Filed Jun. 20, 1978, Ser. No. 917,171
Claims priority, application U.S.S.R., Jun. 23, 1977, 2499472
Int. Cl.[2] F25J *3/06*
U.S. Cl. 62—23 **2 Claims**



1. A method of producing hydrogen from a gaseous mixture including essentially hydrogen, methane and olefins comprising the following steps:

cooling said gaseous mixture in heat exchangers by stages to temperature levels sufficient to ensure removal of the olefins and a portion of the methane from the gaseous mixture in the form of liquid condensate, with said liquid condensate being separated from the gaseous mixture at each cooling stage,

feeding the remaining gaseous mixture comprised of hydrogen and methane into heat exchangers for further cooling by stages to temperature levels sufficient to provide the obtainment of the hydrogen of 85–97 mole percent purities, with the resulting liquid hydrogen-admixed methane condensate being separated at each cooling stage,

feeding said liquid condensate comprised of liquid hydrogen-admixed methane for the purpose of evaporization into said heat exchangers of matching temperature levels countercurrently against the gaseous mixture under separation, as a result of which the liquid condensate is being converted to gaseous hydrogen-admixed methane,

expanding the resulting gaseous hydrogen-admixed methane with the use of vortex effect, as a result of which a cold stream and a hot stream of gaseous hydrogen-admixed methane are being produced,

separately feeding said cold and hot streams of gaseous hydrogen-admixed methane into said heat exchangers of matching temperature levels countercurrently against the gaseous mixture under separation,

expanding the hydrogen 85–97 mole percent purities with the use of vortex effect, as a result of which a cold stream of substantially pure hydrogen and a hot stream of hydrogen-admixed methane are being produced,

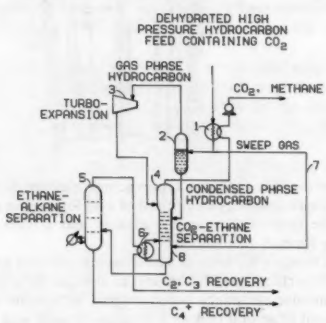
separately feeding said cold and hot streams into said heat exchangers of matching temperature levels countercurrently against the gaseous mixture under separation.

4,185,978

METHOD FOR CRYOGENIC SEPARATION OF CARBON DIOXIDE FROM HYDROCARBONS

Russell L. McGalliard, Chicago, and Gary W. Larrabee, Hazel Crest, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Mar. 1, 1977, Ser. No. 773,359
Int. Cl.[2] F25J *3/02*
U.S. Cl. 62—28 **5 Claims**



1. In a method of treating hydrocarbon feed gas having relatively high carbon dioxide content to produce a liquid ethane-containing hydrocarbon product substantially free of carbon dioxide and a gaseous product comprised of methane and carbon dioxide wherein said treating includes:

(a) expanding a precooled gaseous portion of said hydrocarbon feed gas through a turbine to produce a mixture of gaseous hydrocarbon, including methane, and liquid hydrocarbon, including liquid ethane, said mixture being at a temperature below −80° F.;

(b) passing said mixture to a demethanizer separation column at a temperature below −80° F.; and

(c) separating said mixture in said demethanizer such that essentially all the methane and gaseous carbon dioxide are recovered overhead as said gaseous product and essentially all said liquid hydrocarbon, including liquid ethane, is recovered at the bottom of said demethanizer as said liquid ethane-containing hydrocarbon product, while maintaining nongaseous carbon dioxide dissolved in said liquid ethane-containing hydrocarbon in said turbine and demethanizer, the specific improvement comprising;

injecting from outside the demethanizer column into said ethane-containing liquid hydrocarbon at the bottom of said demethanizer separation column an effective amount of an inert sweep gas which does not liquefy

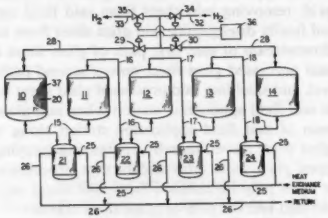
under operating conditions such as to stabilize and desensitize the separation process occurring within said demethanizer with respect to temperature variations of said liquid hydrocarbon at the bottom of said column.

4,185,979

APPARATUS AND METHOD FOR TRANSFERRING HEAT TO AND FROM A BED OF METAL HYDRIDES

Ronald L. Woolley, Orem, Utah, assignor to Billings Energy Corporation, Salt Lake City, Utah

Filed Jan. 31, 1978, Ser. No. 873,867
Int. Cl.[2] F17C *7/02*
U.S. Cl. 62—48 **13 Claims**



1. A method for transferring heat to and from metal hydrides contained in storage containers as hydrogen gas is being charged to or withdrawn from the storage containers, wherein the hydrogen gas which is being charged to or withdrawn from the storage containers functions as a convective energy carrier, said metal hydrides being capable of reacting with and thereby absorbing hydrogen at a given temperature and pressure and thereafter releasing the absorbed hydrogen when the pressure on the metal hydride is reduced or the temperature of the hydride is increased, said method comprising:

(a) connecting a plurality of storage containers containing the metal hydride together in series flow communications, so that when a pressure differential is established across the series of containers, hydrogen will flow from one container to the next container in the direction of the lower pressure;

(b) creating a pressure differential across the series of containers by withdrawing hydrogen from either the first or last container in the series so as to reduce the pressure in that container, or by charging hydrogen to either the first or last container in the series so as to increase the pressure in that container; and

(c) passing the hydrogen gas as it flows between adjacent containers in the series of containers due to the pressure differential established across the series of containers through a heat exchanger means so as to cool the gas when hydrogen is being charged to the series of containers and to heat the gas when hydrogen is being withdrawn from the series of containers.

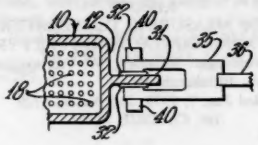
4,185,980

MANUFACTURING GLASS WITH IMPROVED SILICON CARBIDE BUSHING OPERATION

Jay W. Hinze, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sep. 15, 1978, Ser. No. 942,734
Int. Cl.[2] C03B *37/02*
U.S. Cl. 65—1 **10 Claims**

1. In an apparatus for forming glass fibers comprising a glass feeder adapted to discharge a stream of glass, said feeder including a terminal on each of opposed wall portions thereof, and means, including electrical connector means respectively connected to one or the other of said terminals, for passing an electrical current through said feeder so as to maintain said feeder at an elevated temperature, the improvement wherein said feeder essentially comprises silicon carbide, and disposed intermediate each of said terminals and its respective connector means, in electrical contact therewith, is a graphitic member inhibiting the formation of silica.

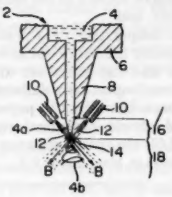


4,185,981

METHOD FOR PRODUCING FIBERS FROM HEAT-SOFTENING MATERIALS

Nobuyoshi Ohsato; Keihachiro Tanaka, and Eiji Mizushima, all of Itami, Japan, assignors to Nippon Sheet Glass Co.,Ltd., Japan

Division of Ser. No. 715,648, Aug. 18, 1976, Pat. No. 4,135,903.
This application Jul. 12, 1978, Ser. No. 924,092
The portion of the term of this patent subsequent to Jan. 23, 1996, has been disclaimed.
Int. Cl.[2] C03B *37/04*
U.S. Cl. 65—5 **1 Claim**



1. A method for producing fibers from a glass material, which comprises:

heating the glass material in a melting crucible to form a viscous melt, and continuously causing the melt to flow from said crucible through at least three melt flowing nozzles provided thereon; and

jetting out at least three substantially straightline high speed gas streams disposed at intervals around each melt in its peripheral direction, each of said streams having a component in the tangential direction along the cross-section of the melt and a component which gradually approaches the central axis line of the melt toward the flowing direction of the melt and then gradually departs from the central axial line, toward the melt which has flown out, whereby the melt is rotated about its central axial line and is formed into a substantially conical shape in a first zone which ranges from the flow-initiating part of the melt to the part at which the gas stream most closely approaches the central axial line of the melt, and in a second zone subsequent to the first zone, the melt being allowed to fly in a fibrous form from the tip of the conical shape in a vortex form in the flowing direction and outwardly in the radial direction and wherein said straight-line high speed gas streams are inclined at an angle of 20° to 70° to the central axial line of the melt, the distance between the outlet of the melt-flowing nozzle and the focal point at which the high speed gas stream most closely approaches the central axial line of the melt being 0.2 to 10 times the effective hole diameter of the melt-flowing nozzle, and said flowing nozzles being disposed close to each other so that when a circle with a radius of 10 mm is drawn about

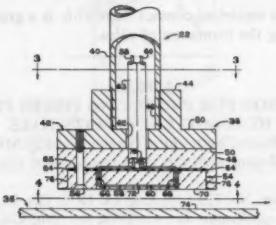
the center of each flowing nozzle as a central point, at least three overlapping portions of these circles occur.

4,185,982

METHOD OF MEASURING TEMPERATURE OF A SHEET WITH A NONCONTACTING-TYPE PYROMETER

Ronald L. Schwenninger, Ridgeley,, W. Va., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 7, 1978, Ser. No. 913,729
Int. Cl.[2] C03B *18/02*
U.S. Cl. 65—29 **7 Claims**



1. A noncontacting method of measuring temperature of a sheet, comprising the steps of:

providing a heat absorbing member having an essentially flat major surface and adjacent peripheral surface portions;

mounting the major surface of the member a spaced distance from the sheet; and

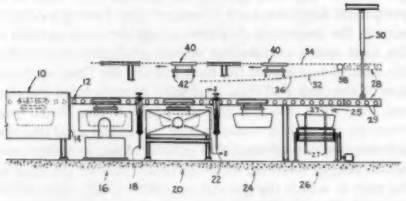
measuring the temperature of a preselected region of the member adjacent the major surface of the member when the member and the sheet are at thermal equilibrium wherein thermal aspect ratio defined as the ratio of (1) the spaced distance between the preselected region of the member and closest peripheral surface portion of the member and (2) the spaced distance between the member and the sheet is at least about 0.5.

4,185,983

METHOD AND APPARATUS FOR PROTECTING TONG-SUSPENDED GLASS SHEETS FROM BUFFETING

Anthony R. Febbo, Altoona, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 1, 1978, Ser. No. 956,563
Int. Cl.[2] C03B *27/00*
U.S. Cl. 65—104 **14 Claims**



1. In apparatus for processing a series of glass sheets suspended from tongs while conveyed along a first path of glass sheet travel extending in succession through a heating furnace and a fluid application station to a transfer station for transfer to a second path of glass sheet travel wherein each glass sheet is supported along its lower edge between pegs through an additional cooling area,

the improvement comprising gate means located downstream of said fluid application station and upstream of said transfer station, and means operatively connected to said gate means to position said gate means in a first position across said first path and a second position clear of said first path, thereby permitting a glass sheet downstream of said fluid application station to be shielded by said gate means from fluid applied against a succeeding glass sheet in said series at said fluid application station, thereby permitting said glass sheet to cool without substantial swaying while gripped by tongs along said first path downstream of said fluid application station before it is transferred to said second path.

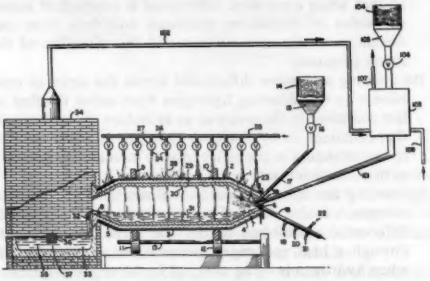
10. A method of handling glass sheets comprising gripping each of a series of glass sheets with tongs near its upper edge, conveying said glass sheets along a first path of glass sheet travel through a hot atmosphere to heat said glass sheet to an elevated temperature sufficient for further processing, then subjecting said hot sheet to further processing by applying fluid at a fluid application station along said first path of glass sheet travel, removing said sheet from said fluid application station and finally disengaging said glass sheet from said tongs further downstream of said first path of glass sheet travel to deposit said processed glass sheet onto a second path of glass sheet travel, and shielding said processed glass sheet from fluid applied at said fluid application station when said glass sheet is downstream of said fluid application station along said first path of glass sheet travel, thereby minimizing swaying of said tong-gripped glass sheet after said further processing so that said glass sheet may be released from said tongs more accurately onto said second path of glass sheet travel.

4,185,984

PROCESS FOR PRODUCING GLASS IN A ROTARY FURNACE

Kazuo Kiyonaga, Tarrytown, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 875,550, Feb. 6, 1978, abandoned. This application Jun. 21, 1978, Ser. No. 917,561
The portion of the term of this patent subsequent to Dec. 6, 1994, has been disclaimed.
Int. Cl.[2] C03B *5/16*
U.S. Cl. 65—135 **6 Claims**



1. In a process for producing molten glass in a generally cylindrical continuously rotating chamber comprising the following steps:

(a) feeding inorganic raw materials comprising

(i) inorganic raw materials, which alone or in mixture with each other melt at a temperature of less than about 2500° F., in an amount of about 6 percent to about 45 percent by weight; (ii), inorganic raw materials, which alone or in mixture with each other melt at a temperature greater than about 2500° F. in an amount of about 55 percent to about 94 percent by weight; and (iii) silica, as a component of (ii), in an amount of at least about 50 percent by weight, percent by weight being based on the total weight of the inorganic raw materials, into the chamber;

(b) providing a flame of high intensity heat produced by the combustion of fuel with a gas containing about 50 to about 100 percent by volume oxygen and directing the flame

into the chamber in such a manner that the raw materials are melted; and

(c) rotating said chamber at a sufficient speed and cooling the exterior of the chamber with a liquid coolant in such a manner that the inner surface of the chamber is coated with a layer of molten glass, the layer is solidified, and a solidified layer of glass is maintained throughout the process whereby the solidified layer essentially prevents impurities from the inner surface of the chamber from entering the melt, and

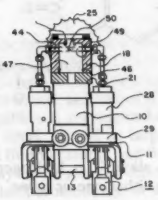
(d) withdrawing molten glass, the improvement comprising heating the inorganic raw materials of (ii), including the silica, just prior to step (a) to a temperature im the range of about 500° F. to about 2500° F.

4,185,985

TONG HEAD ASSEMBLY

William Wenz, 427 Carlton Ave., Millville, N.J. 08332

Continuation of Ser. No. 726,840, Sep. 27, 1976, abandoned, which is a division of Ser. No. 618,234, Sep. 30, 1975, Pat. No. 3,982,919. This application Jan. 27, 1978, Ser. No. 872,763
The portion of the term of this patent subsequent to Sep. 28, 1993, has been disclaimed.
Int. Cl.[2] C03B *9/44*
U.S. Cl. 65—172 **1 Claim**



1. A take-out tong head assembly for use in glass molding equipment including:

a tong holder guide bracket;

a central support member mounted on said tong holder guide bracket adjacent the center thereof and extending upwardly therefrom, said central support member including an air passage in the upper portion thereof;

a pair of scissors tong assemblies mounted on the lower side of said tong holder guide bracket and being spaced on either side of and substantially equidistant from said central support member, each of said scissors tong assemblies being operative independently of the other scissors tong assembly;

a pair of pneumatic cylinder assemblies mounted on the upper surface of said tong holder guide bracket on either side of and substantially equidistant from said central support member, each of said pneumatic cylinder assemblies including a a cylinder, piston and piston rod;

means interconnecting each of said piston rods to a different one of said scissors tong assemblies whereby each of said scissors tong assemblies is controlled by a different one of said cyliner assemblies, and

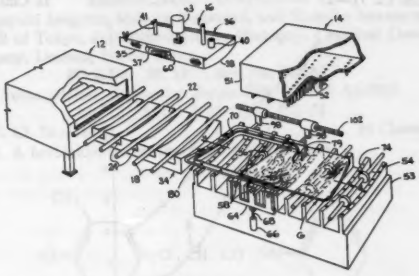
a pair of air lines, each of which extends outwardly from one side of the upper portion of said central support member, each of said air lines being connected to the upper portion of a different one of said pneumatic cylinder assemblies and to said air passage.

4,185,986

APPARATUS FOR HANDLING GLASS SHEETS DURING SHAPING AND COOLING

Robert G. Frank, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 25, 1978, Ser. No. 954,693
Int. Cl.[2] C03B *23/02, 27/00*
U.S. Cl. 65—287 **8 Claims**



1. Apparatus adapted for supporting a glass sheet slightly within its peripheral margin during its conveyance from a first station to a second station downstream of said first station comprising a ring-like member having an upper edge surface conforming in elevation and outline to the shape of said glass sheet and extending slightly within the peripheral margin of said glass sheet, said ring-like member comprising a pair of longitudinal side portions each having an upstream end and a downstream end and extending between its ends along one or the other lateral side edges of said member, an upstream end portion extending continuously between the upstream ends of said longitudinal side portions and a pair of downstream end portions, one of said downstream end portions extending transversely inwardly of the downstream end of one of said longitudinal side portions and the other of said downstream end portions extending transversely inwardly of the downstream end of the other of said longitudinal side portions, the laterally inner ends of said downstream end portions being laterally spaced from one another to provide a transversely extending space therebetween.

4,185,987

METHOD OF PREPARING GROWTH SUBSTRATES HAVING A PREDETERMINED PARTICLE SIZE

Simo O. Tiikanen, Kyrö, Finland, assignor to Farmos-Yhtyma Oy, Turku, Finland

Filed Feb. 24, 1978, Ser. No. 880,799
Claims priority, application Finland, Mar. 9, 1977, 770749
Int. Cl.[2] C05F *11/02*
U.S. Cl. 71—24 **5 Claims**

1. Method of preparing a growth substrate having a predetermined particle size, comprising the steps of extracting peat blocks in the natural state from a bog, drying the peat blocks to a moisture content of 10 to 30%, compressing the dried peat blocks in the range of $\frac{1}{3}$ to 1/10 of their initial size, and reducing the compressed dried peat blocks into particles of a predetermined particle size.

4,185,988
ANTICAKING COMPOSITIONS

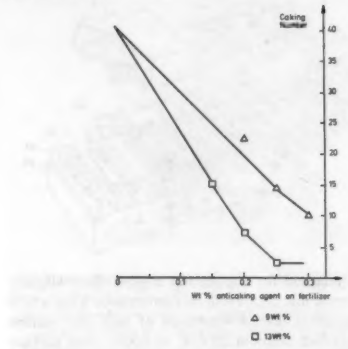
Jean P. Kistler, and Michel Guinot, both of Mont-Saint-Aignan, France, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 728,970, Oct. 4, 1976, abandoned. This application Jul. 28, 1978, Ser. No. 928,816

Claims priority, application United Kingdom, Oct. 2, 1975, 40320/75

Int. Cl.[2] C05G *3/00*

U.S. Cl. 71—27 **16 Claims**



1. Fertilizer granules coated with a hydrophobic layer in an amount ranging from 0.005 to 0.4% by weight based on the weight of said fertilizer, said hydrophobic layer comprising mineral oil having dissolved therein from 0.01 to 20% by weight of an alkylaryl sulfonate of a nitrogen-containing compound, said sulfonate derived from a synthetic alkylaryl sulfonic acid of molecular weight greater than 400.

4,185,989
3-PHENACYL PHTHALDIDE SAFENING AGENTS

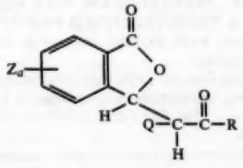
John A. Houbion, Kirkwood, and David E. Schafer, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jul. 28, 1978, Ser. No. 929,132

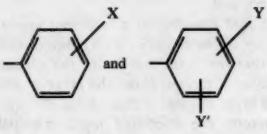
Int. Cl.[2] A01N *9/00, 9/20*

U.S. Cl. 71—88 **55 Claims**

1. A method of reducing injury to rice plants due to application thereto of a herbicide selected from the group consisting of butachlor, 2-chloro-2′-tert. butyl-6′-methylacetanilide, N-(2-butoxyethyl)-N-(2,6-dimethyl-1-cyclohexen-1-yl)-α-chloroacetamide and 2-chloro-2′-tert. butyl-6′-methyl-N-(butoxymethyl)acetanilide which comprises applying to said rice plants or to the plant growth medium an effective safening amount of a compound of the formula



wherein: R is selected from phenyl, α-naphthyl, cyclohexyl, dichlorophenyl provided that the chloro substituents are not on adjacent carbon atoms, trichlorophenyl, di(lower alkyl)-phenyl, tri(lower alkyl)phenyl, di(lower alkoxy) phenyl provided that at least one meta position is unsubstituted,



where X is lower alkyl, lower alkoxy, chloro, fluoro, iodo, trifluoromethyl, hydroxy, amino or 3′-nitro, and Y and Y′ are unlike and are hydroxy, methyl or lower alkoxy; a is zero or one; Z is selected from 5, 6 or 7-chloro, 6-nitro and methoxy provided that when Z is 4-methoxy R must be a substituted phenyl; and Q is hydrogen or bromo provided that when Q is bromo at least one of X, Y, Y′ or Z must be lower alkoxy.

4,185,990
IMIDES DERIVED FROM 2-OXO-3-BENZOTHIAZOLINEACETIC ACID AND BUTYRIC ACID

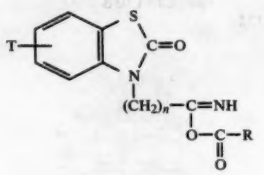
John J. D'Amico, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 28, 1978, Ser. No. 937,231

Int. Cl.[2] A01N *9/12, 9/22;* C07D *277/68*

U.S. Cl. 71—90 **22 Claims**

6. A method for preventing the growth of undesirable plants which comprises applying to the plant locus a herbicidally effective amount of a compound having the formula



wherein R is lower alkyl, T is hydrogen, halogen, nitro or lower alkyl, and n is either one or three.

4,185,991
4,5-DICHLORO-IMIDAZOLE DERIVATIVES AND THEIR USE AS HERBICIDES

Klaus Sasse, Berg.Gladbach; Gunther Beck; Ludwig Eue, both of Leverkusen, and Robert R. Schmidt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

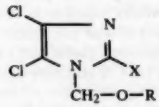
Division of Ser. No. 835,095, Sep. 21, 1977. This application Sep. 25, 1978, Ser. No. 945,288

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1976, 2646144

Int. Cl.[2] C07D *233/90;* A01N *9/22*

U.S. Cl. 71—92 **4 Claims**

1. A 4,5-dichloro-imidazole derivative of the formula



(I)

in which

X represents trifluoromethyl or cyano, and

R represents straight-chain or branched alkyl with 1 to 6 carbon atoms or straight-chain or branched alkenyl or alkynyl each with up to 6 carbon atoms, it being possible for each of these radicals to carry one or more substituents

selected from fluorine, chlorine, bromine, alkoxy with 1 to 4 carbon atoms, alkylmercapto with 1 to 4 carbon atoms, cycloalkyl with 5 or 6 carbon atoms in the ring and phenyl which itself may optionally carry one or more substituents selected from alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 3 carbon atoms, fluorine, chlorine, bromine and trifluoromethyl, or R represents cycloalkyl with 5 or 6 carbon atoms in the ring or phenyl which has identical or different substituents at least in the 2- and 4- positions, the substituents being selected from methyl, halogen, alkoxy with 1 to 4 carbon atoms and trifluoromethyl.

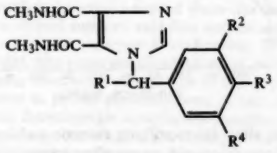
4. A method of combatting a weed which comprises applying to the weed or its habitat a herbicidally effective amount of a compound according to claim 1.

4,185,992
IMIDAZOLE DERIVATIVES

James Gilmour, Dagenham, England, assignor to May & Baker Limited, Essex, England

Filed Mar. 2, 1978, Ser. No. 882,857
Claims priority, application United Kingdom, Mar. 4, 1977, 9277/77
Int. Cl.[2] C07D *233/90;* A01N *9/22*
U.S. Cl. 71—92 46 Claims

1. An imidazole derivative of the formula:



wherein R^1 represents hydrogen or a straight- or branched-chain alkyl group containing from 1 to 4 carbon atoms or a straight- or branched-chain alkenyl or alkynyl group containing from 2 to 4 carbon atoms, and one of R^2, R^3 and R^4, which may be the same or different, represents halogen, trifluoromethoxy, or a methyl, ethyl, propyl or isopropyl group substituted by one or more fluorine atoms, and the other symbols R^2, R^3 and R^4, which may be the same or different, each represent hydrogen, halogen, trifluoromethoxy, or a methyl, ethyl, propyl, or isopropyl group optionally substituted by one or more fluorine atoms, or one of the symbols R^2, R^3 and R^4 represents methoxy and at least one of the other symbols R^2, R^3 and R^4 represents halogen, trifluoromethoxy, or a methyl, ethyl, propyl or isopropyl group optionally substituted by one or more fluorine atoms.

19. A method of controlling the growth of weeds at a locus which comprises applying to the locus a herbicidal composition containing a herbicidally-effective amount of an imidazole derivative as claimed in claim 1.

4,185,993
HERBICIDAL COMPOSITIONS AND METHODS

Max A. Morse, Streetsville, Canada, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Nov. 14, 1973, Ser. No. 415,559
Claims priority, application United Kingdom, Nov. 14, 1972, 52643/72
Int. Cl.[2] A01N *9/22*
U.S. Cl. 71—93 16 Claims

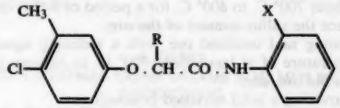
1. A herbicidal composition suitable for achieving pre-emergent herbicidal activity in corn crops, comprising a herbicidally effective amount of a mixture of active ingredients consisting essentially of 2,4-bis(isopropylamino)-6-methylthio-S-triazine, 2-tert-butylamino-4-ethylamino-6-methylthio-S-triazine and at least one member selected from the group consisting of 2-chloro-4-ethylamino-6-isopropylamino-S-triazine and 2-chloro-4,6-bis(ethylamino)-S-triazine, said triazines being the only active ingredients in the composition, the weight ratio of 2-tert-butylamino-4-ethylamino-6-methylthio-S-triazine to the combined weight of the other active ingredients in the mixture being from about 8:1 to about 1:9 and the weight ratio of 2,4-bis(isopropylamino)-6-methylthio-S-triazine to 2-chloro-4-ethylamino-6-isopropylamino-S-triazine, 2-chloro-4,6-bis(ethylamino)-S-triazine or mixture thereof being from about 3:1 to about 1:6.

4,185,994
HERBICIDAL COMPOUND

Takayuki Isogawa; Makoto Nagatomi, and Shosuke Imamura, all of Tokyo, Japan, assignors to Hodogaya Chemical Company, Limited, Toyko, Japan

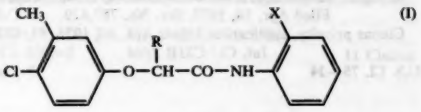
Filed Dec. 29, 1977, Ser. No. 865,417
Claims priority, application Japan, Feb. 2, 1977, 52-9769
Int. Cl.[2] A01N *9/20;* C07C *103/28*
U.S. Cl. 71—118 10 Claims

1. A herbicidal compound having the formula



wherein R represent H or CH_3 and X represent H or Cl.

6. A method of treating soil with a herbicide, which comprises adding to the soil a compound of the formula (I)



(I)

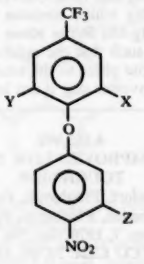
wherein R represents H or CH_3 and X represents H or Cl.

4,185,995
HERBICIDAL 4-TRIFLUOROMETHYL-4'NITRODIPHENYL ETHERS

Horst O. Bayer, Levittown; Colin Swithenbank, Perkasie, and Roy Y. Yih, Doylestown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 617,562, Sep. 29, 1975, Pat. No. 4,046,798, which is a division of Ser. No. 331,719, Feb. 12, 1972, Pat. No. 3,928,416, which is a continuation-in-part of Ser. No. 234,651, Mar. 14, 1972, Pat. No. 3,798,276. This application Jun. 20, 1977, Ser. No. 808,415
Int. Cl.[2] A01N *9/20*
U.S. Cl. 71—124 20 Claims

1. A herbicidal composition comprising an effective amount of a compound of the formula



wherein

X is a hydrogen atom, a halogen atom, a trifluoromethyl group, or a (C_1–C_4)alkyl group,

Y is a hydrogen atom, a halogen atom, or a trifluoromethyl group, and

Z is a hydroxy group or an alkoxy group having up to 6 carbon atoms,

and an agronomically acceptable carrier.

4,185,996

ARSENIC AND SULFUR ELIMINATION FROM COBALTIFEROUS ORES

Adolfo R. Zambrano, Hibbing, Minn., assignor to The Hanna Mining Company, Cleveland, Ohio

Filed Feb. 13, 1978, Ser. No. 877,002
Int. Cl.[2] B03D *1/00*; C22B *1/02*
U.S. Cl. 75—2 **8 Claims**

1. A method for removing sulfur and arsenic from cobaltiferous ores and recovering an enriched cobalt product comprising the steps of

(a) oxidizing said ore in the presence of air at a temperature of about 700° C. to 800° C. for a period of 3 to 8 hours to reduce the sulfur content of the ore,

(b) heating said oxidized ore with a reducing agent at a temperature of at least about 700° C. to remove arsenic from the ore, and

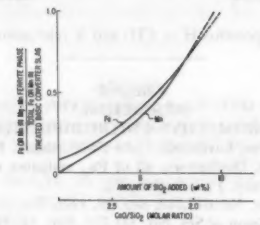
(c) recovering a solid enriched in cobalt.

4,185,997

PROCESS FOR TREATING BASIC CONVERTER SLAG

Katsuhiko Inoue, Takarazuka, and Tsutomu Ikeda, Kobe, both of Japan, assignors to Kobe Steel Limited, Hyogo, Japan

Filed Apr. 14, 1977, Ser. No. 787,429
Claims priority, application Japan, Apr. 15, 1976, 51/43341
Int. Cl.[2] C21B *3/04*
U.S. Cl. 75—24 **7 Claims**



1. A process for treating basic converter slag, comprising the steps of:

subjecting basic converter slag in a molten state to an oxidation treatment;

adjusting the basicity of said slag such that the CaO/SiO_2 molar ratio ranges from 1.5 to 2.5 by the addition of a material containing SiO_2; and then cooling and solidifying said slag, whereby said basic converter slag may be converted into a slag which contains as the main mineral constituents a Mg-Mn ferrite phase and a di-calcium silicate phase, and such that the ratio of iron distributed in said Mg-Mn ferrite phase to the total iron content of said treated basic converter slag is not less than 25%.

4,185,998

STEEL WITH IMPROVED LOW TEMPERATURE TOUGHNESS

Bartholomew G. Reisdorf, Pittsburgh, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 7, 1978, Ser. No. 967,347
Int. Cl.[2] C22C *38/06, 38/44*
U.S. Cl. 75—124 **5 Claims**

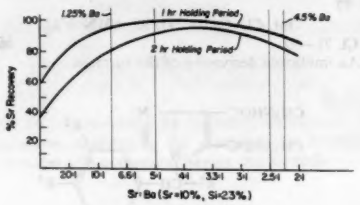
1. In a steel product having a composition consisting essentially of 0.02 to 0.12% C, 0.20 to 1.0% Mn, 0.6 to 1.5% Ni, 0.3 to 1.4% Cr, 0.1 to 0.9% Mo, up to 1.5% Cu, Al in an amount at least sufficient to kill said steel, balance Fe, said product having a yield strength in excess of 60 ksi and a Charpy v-notch energy absorption at −80° F. of at least 50 ft-lb in both the longitudinal and transverse directions, the improvement for enhancing low-temperature toughness with no sacrifice in yield strength by maintaining the Si content of said composition at a level equal to or below 0.10%.

4,185,999

BARIUM-STRONTIUM-SILICON-ALUMINUM MASTER ALLOY

Robert G. Seese, Youngstown; Alan Fitzgibbon, Lewiston, and Frank Slish, Grand Island, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed May 31, 1978, Ser. No. 911,095
Int. Cl.[2] C22C *21/02*
U.S. Cl. 75—148 **4 Claims**



1. A master alloy for modifying eutectic and hypoeutectic aluminum-silicon alloys said master alloy consisting essentially of from about 1.25 to 4.5% barium, 8 to 15% strontium, 10 to 25% silicon balance aluminum and incidental impurities, the ratio of strontium to barium being from about 9.6:1 to 2.25:1.

4,186,000

SALT-COATED MAGNESIUM GRANULES

Edward J. Skach, Jr., Freeport, Tex., and George B. Cobel, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 25, 1978, Ser. No. 936,977
Int. Cl.[2] C22C *1/04*
U.S. Cl. 75—0.5 B **21 Claims**

21. A process for producing rotund, salt-coated granules of Mg or Mg alloy containing about 2% to about 20% by weight of salt as a coating, and having a particle size in the range of about 10 mesh to about 65 mesh, said granules being useful as an inoculant material for molten ferrous metal, said process comprising

melting together, at a temperature in the range of about 670° C. to about 820° C., a mixture comprising

up to about 42% by weight of Mg or Mg alloy,

at least about 58% by weight of salt comprising at least one of the group consisting of alkali metal halide and alkaline earth metal halide, and

at least about 400 ppm, as boron, of a boron-containing dispersing agent based on Mg or Mg alloy,

stirring the melt for a time sufficient to substantially disperse the boron-containing dispersing agent and the Mg or Mg alloy in the salt,

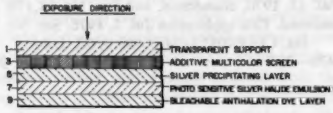
cooling the melt to freeze the salt and the Mg or Mg alloy dispersed therein,

pulverizing the frozen salt matrix in a hammer mill to free the Mg or Mg alloy particles entrapped therein, the said particles still retaining a thin salt coating adhered thereto, and separating from the pulverant the salt-coated Mg or Mg alloy particles in the range of about 10 mesh to about 65 mesh.

4,186,001
PHOTOGRAPHIC PRODUCTS AND PROCESSES EMPLOYING A 3,3 DISUBSTITUTED SULFAM(NA)PHTHALEIN FILTER DYE

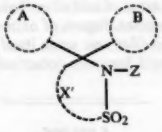
James W. Foley, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 2, 1978, Ser. No. 957,161
Int. Cl.[2] G03C 1/40, 1/84, 7/00, 5/54
U.S. Cl. 430—220 51 Claims



37. A photographic process for forming a multicolor diffusion transfer image which comprises the steps of:

(a) exposing a photosensitive film unit which includes, in combination, a first sheet-like element comprising a first support carrying a red-sensitive silver halide emulsion layer, a green-sensitive silver halide emulsion layer, and a blue-sensitive silver halide emulsion layer, said silver halide emulsion layers having associated therewith, respectively, a cyan image dye-providing material, a magenta image dye-providing material and a yellow image dye-providing material; a second sheet-like element comprising a second support; said first and second sheet-like elements being in superposed relationship, or adapted to be brought into superposed relationship, with said supports being outermost; at least one of said supports being transparent to permit photoexposure of said silver halide emulsions therethrough; a rupturable container releasably holding an aqueous alkaline processing composition, said rupturable container being so positioned as to be capable of discharging said processing composition between a pair of predetermined layers carried by said supports; an image-receiving layer carried by one of said supports; and a colored light-screening dye disposed in a processing composition permeable layer carried by one of said supports, said light-screening dye being a compound of the formula



wherein A is a 4'-hydroxy-1'-napthyl moiety substituted in the 3'-position with a group,

wherein R^I is perhalomethyl and R^{II} is hydrogen or perhalomethyl; B is a phenyl moiety substituted with an electron-donating substituent; X' represents the atoms necessary to complete a ring-closing moiety selected from a sulfamphthalein moiety and a sulfamnaphthalein moiety; and Z is a carbonyl moiety possessing a

group bonded to said N atom of said ring-closing moiety that undergoes an irreversible cleavage reaction in alkaline solution above a predetermined alkaline pH, said B moiety being sufficiently electron donating to give a compound having an epsilon of at least 4000 in the visible wavelength range as measured in trifluoroethanol;

(b) contacting said silver halide layer(s) and said light-screening dye with a processing composition having an alkaline pH above said predetermined pH;

(c) effecting thereby development of said silver halide layer(s);

(d) maintaining the pH of said processing composition in contact with said light-screening dye above said predetermined alkaline pH for a time sufficient to effect irreversible cleavage of said Z moiety whereby said colored light-screening dye is converted to a colorless compound;

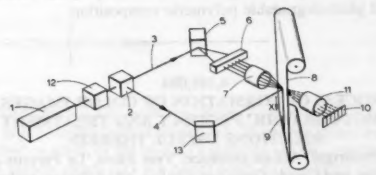
(e) forming as a result of said development, an imagewise distribution of diffusible image dye-providing material; and

(f) transferring, by diffusion, at least a portion of said imagewise distribution of diffusible image dye-providing material to said image-receiving layer to provide a transfer image thereto.

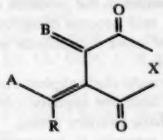
4,186,002
PHOTOCHROMIC COMPOUNDS FOR HOLOGRAM RECORDING

Harold G. Heller, 11 Erwgoch, Waunfawr, Aberystwyth, Dyfed SY23 3AZ, Wales; Peter Waterworth, 8 Greenway, Eastcote, Towcester, Northants, and Rodney J. Hurditch, 8 Hadrian Gate, Brackley, Northants, both of England

Filed Oct. 27, 1978, Ser. No. 955,342
Claims priority, application United Kingdom, Oct. 28, 1977, 45011/77
Int. Cl.[2] G03C 5/04, 1/52
U.S. Cl. 430—1 11 Claims



1. A holographic data recording and storage method which comprises subjecting a photochromic recording material to radiation whereby the material is converted to its coloured form and forming a holographic record using coherent visible light by interfering a reference beam and a data beam in the plane of the surface of the material whereby a series of holograms embodying data recorded from said data beam are formed by bleaching said material, said photochromic material comprising a substrate having coated thereon or dispersed therein a photochromic compound of the general formula:



(I)

wherein

x represents oxygen or $>NR_6$, R_6 being hydrogen or an alkyl, aryl or aralkyl group;

R represents an alkyl, aryl, aralkyl or heterocyclic group;

A represents a 3-furyl, 3-thienyl, 3-benzofuryl or 3-benzothienyl group;

B represents an adamantylidene group or the grouping

in which R_2 and R_3 independently represent an alkyl, aryl, aralkyl or heterocyclic group or one of R_2 and R_3 represents hydrogen and the other represents an alkyl, aryl, aralkyl or heterocyclic group.

4,186,003

HYBRID FIX SYSTEM INCORPORATING PHOTODEGRADABLE POLYMERS

Dana G. Marsh, Rochester, and John M. Pochan, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 7, 1974, Ser. No. 512,591
Int. Cl.[2] G03G *9/10, 13/20*
U.S. Cl. 430—97 **12 Claims**

1. A toner comprising a colorant and a photodegradeable polymer containing segments satisfying the formula:

where R is H, an alkyl group of 1 to 6 carbon atoms, a chlorine or fluorine substituted group of 1 to 6 carbon atoms or, a cyano substituted aliphatic hydrocarbon group of 1 to 5 carbon atoms; and a photoactive agent which upon activation is capable of abstracting a hydrogen atom from the polymer backbone of said photodegradable polymeric composition.

4,186,004

PROCESS OF FORMATION OF COLOR IMAGES, PHOTOGRAPHIC PRODUCT AND TREATMENT SOLUTIONS USEFUL THEREIN

Jean Deabriges, Aix-en-provence; Yves Ferre, Le Perreux-sur-Marne, and Claude Goumont, Chelles, all of France, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 29, 1977, Ser. No. 837,778
Claims priority, application France, Oct. 15, 1976, 76 31058
Int. Cl.[2] G03C *7/00, 1/40, 5/54, 5/30*
U.S. Cl. 430—218 **17 Claims**

15. A process for retaining a photographic image in a color diffusion transfer unit comprising:

(a) imagewise-exposing a photosensitive element comprising a transparent support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material and

(b) treating said photosensitive element with an alkaline processing composition in the presence of a silver halide developing agent, said process being carried out in the presence of one or more compounds selected from the group consisting of:

(i) unsubstituted straight chain aliphatic ω-amino acids and

(ii) a mixture of at least one aliphatic carboxylic acid and at least one aliphatic primary amine,

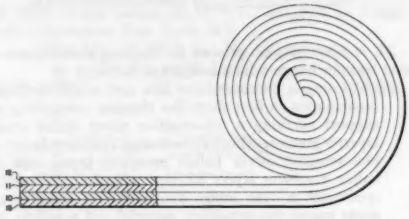
whereby dye-forming material is imagewise-eliminated by diffusion in a solution or by mordanting on a strippable support, thus forming in the retained product an image corresponding to the dye remaining in the unit and wherein the retained image is further treated by a bleaching and fixing bath to dissolve the residual silver halide and bleach the developed silver image.

4,186,005

PHOTOGRAPHIC PRODUCTS AND PROCESSES EMPLOYING ROLL FILM WITH ACID BACKING LAYER

Richard J. Haberlin, Weston, and Robert K. Stephens, Burlington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 401,683, Sep. 28, 1973, abandoned, which is a continuation of Ser. No. 249,696, May 1, 1972, abandoned, which is a continuation-in-part of Ser. No. 54,176, Jul. 13, 1970, abandoned, and Ser. No. 54,170, Jul. 13, 1970, abandoned. This application Jul. 2, 1975, Ser. No. 592,613
Int. Cl.[2] G03C *5/54, 1/48, 3/02, 5/24*
U.S. Cl. 430—228 **9 Claims**



9. A photographic process which comprises, in combination, the steps of:

(a) unwinding and exposing an elongated strip of a photographic film unit comprising a permanent laminate which contains a common support carrying on a first surface a layer of photosensitive silver halide crystals in a hydrophilic binder and a layer of silver precipitating nuclei in a hydrophilic binder and on a second surface a layer of hydrophilic processing composition permeable polymeric material having disposed therein an acid reacting reagent selected from the group consisting of ascorbic acid and polymeric acid;

(b) contacting said exposed silver halide layer with an aqueous processing composition containing a silver halide developing agent and a silver halide solvent, thereby providing a visible silver image to said film unit in terms of the unexposed areas of said silver halide layer as a function of the point-to-point degree of exposure thereof;

(c) rewinding said film unit upon itself; and

(d) maintaining said laminate intact subsequent to processing.

4,186,006

METHOD FOR DEVELOPING A LITHOGRAPHIC PRINTING PLATE

Kesanao Kobayashi; Hiroshi Matumoto, and Yasuhisa Naritomi, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 3, 1977, Ser. No. 839,058
Claims priority, application Japan, Oct. 1, 1976, 51-118216
Int. Cl.[2] G03F *7/02;* G03C *1/58, 1/52*
U.S. Cl. 430—302 **23 Claims**

1. In a process for producing a lithographic printing plate which comprises imagewise exposing a light-sensitive lithographic printing plate comprising a support with a hydrophilic surface having thereon a light sensitive layer containing an organic solvent-soluble, substantially water-insoluble light sensitive diazo resin which is a reaction product of a water-soluble diazo resin with an aromatic or aliphatic compound containing one or more phenolic hydroxy groups or sulfonic acid groups or both of said groups, said water-soluble diazo resin being a condensate of a diphenylamine p-diazonium salt with aldol, acetal or formaldehyde and a hydrophobic resin selected from the group consisting of epoxy resins, polyamide resins, polyvinyl halides, acetal resins, butyral resins, soluble urethane

resins, polystyrene-maleic anhydride copolymers, half esters and half amides thereof, cellulose derivatives, shellac, rosin, modified rosin, acrylic acid-acrylate copolymers, copolymers of hydroxyalkyl acrylate or methacrylate and acrylonitrile, methacrylonitrile copolymers, mathacrylic acid copolymers, and mixtures thereof and treating the imagewise exposed lithographic printing plate with a developer composition to remove the unexposed areas, the improvement which comprises using a developer composition consisting essentially of an aqueous solution containing (a) benzyl alcohol, α-methylbenzyl alcohol, ethylene glycol monophenyl ether and/or glycol monobenzyl ether in an amount of about 0.2 to about 15% by weight, (b) an anionic surface active agent selected from the group consisting of salts of higher alcohol sulfuric acid esters, salts of aliphatic alcohol phosphoric acid esters, alkylaryl sulfonic acid salts, sulfonic acid salts of alkylamides, and sulfonic acid salts of carboxylic aliphatic acid esters in an amount of about 0.1 to about 5% by weight, and (c) a water-soluble alkali metal or alkaline earth metal sulfite in an amount of about 0.05 to about 3% by weight.

4,186,007

REGENERATION OF SPENT COLOR DEVELOPERS

Heinz Meckl, Bergisch-Gladbach, and Karl Lohmer, Leverkusen, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 17, 1978, Ser. No. 896,937

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1977, 2717674

Int. Cl.² G03C *5/26, 5/30*

U.S. Cl. 430—467 **5 Claims**

1. A process for the regeneration of a spent color developer solution which has been used for the color development of photographic materials containing at least one silver halide emulsion layer

including the steps of

first contacting a spent color developer solution containing bromide ions with an adsorbent selected from the group consisting of adsorption resins, active charcoal, surface-modified active charcoal, and Fuller's earths,

and then contacting said spent color developer solution with an anion exchanger to remove bromide ions, and subsequently treating said anion exchanger to improve the bromide ion removable capability of said anion exchanger.

4,186,008

METHOD FOR PROCESSING SILVER DYE-BLEACH MATERIALS

Meinrad Schar, and Matthias Schellenberg, both of Marly, Switzerland, assignors to Ciba-Geigy Aktiengesellschaft, Basel, Switzerland

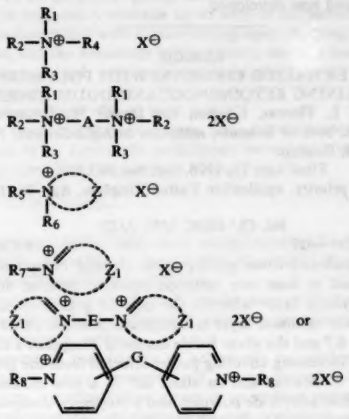
Filed Mar. 15, 1978, Ser. No. 886,870

Claims priority, application Switzerland, Mar. 23, 1977, 3665/77

Int. Cl.² G03C *7/00*

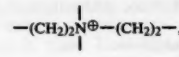
U.S. Cl. 430—393 **21 Claims**

1. A method for processing imogeuise exposed silver dye-bleach materials, with the process measures (1) silver developing, (2) dye bleaching, (3) silver bleaching and (4) fixing, optionally process measure (3) can be combined with process measure (2) in a single treatment step, which method comprises employing for the silver bleaching (3) or the combined dye (2) and silver bleaching (3) an acid formulation which has a pH value of at most 2 and contains (a) a strong acid, (b) a water-soluble iodide, (c) optionally a water-soluble organic nitro compound, (d) a non-quaternised quinoxaline or pyrazine, (e) an anti-oxidant and (f) at least one quaternary ammonium salt of the formulae



or a protonated tertiary organic nitrogen base of the formula

in which formulae R_1, R_2, R_3, R_4 and R_5 independently of one another are methyl or ethyl, R_6 is methyl or ethyl or $—CH_2C-H_2—$, in which case this grouping is bonded to a further quaternary nitrogen atom of Z, Z is $—(CH_2)_5—$or



R_7 is alkyl having 1 to 4 carbon atoms, unsubstituted or substituted aryl or hydroxyalkyl having 1 to 20 carbon atoms and R_8 is methyl or ethyl, or the two R_8's together are alkylene having 2 to 4 carbon atoms if G is a direct bond, G is a direct bond or alkylene having 1 to 20 carbon atoms, Z_1 is the atoms necessary to form a pyridine, pyrazine or quinoline ring, which is unsubstituted or substituted by methyl, ethyl or hydroxyalkyl having 1 to 12 carbon atoms, and Z_2 is the atoms necessary to form a pyridine or quinoline ring, which is unsubstituted or substituted by methyl, ethyl or hydroxyalkyl having 1 to 12 carbon atoms, A and E are alkylene having 1 to 20 carbon atoms and $X^{\ominus}$ is a monovalent anion.

4,186,009

COVERING POWER PHOTOTHERMOGRAPHIC MATERIAL AND PROCESS

Cynthia G. Jones, Bergen, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 30, 1978, Ser. No. 912,168

Int. Cl.² G03C *5/24, 1/02*

U.S. Cl. 430—353 **26 Claims**

1. A covering power, heat developable photographic element comprising a support having thereon, in binder and in reactive association:

(a) negative-working photosensitive silver halide,

(b) an image-forming combination comprising

(i) an organic silver salt oxidizing agent containing a heterocyclic thione ligand or 1,2,4-mercaptotriazole ligand with

(ii) an organic reducing agent, and

(c) a nucleating concentration of a hydrazino thiourea nucleating agent,

said element being capable of providing a positive image when exposed and heat developed.

4,186,010

SILVER HALIDE ELEMENTS WITH POLYMERS CONTAINING KETOIMINOGUANIDINIUM GROUPS

Raymond L. Florens, Edegem, and Daniël M. Timmerman, Mortsel, both of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

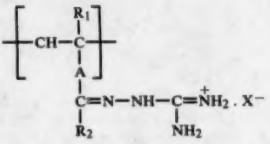
Filed Apr. 11, 1975, Ser. No. 567,109

Claims priority, application United Kingdom, Apr. 26, 1974, 18425/74

Int. Cl.² G03C *5/30, 1/72*

U.S. Cl. 430—627 **5 Claims**

1. A black-and-white photographic element comprising a support and at least one radiation sensitive gelatino silver halide emulsion layer wherein the ratio of gelatin to silver halide in the emulsion layer is comprised between about 0.2 and about 0.7 and the silver halide emulsion comprises a compound for increasing covering power selected from the group consisting of dextran and an alkali salt of a low molecular weight meleic anhydride polymer, and a polymeric compound containing recurring units with ketoiminoguanidinium groups in the side chain of the formula:



wherein

R_1 is hydrogen or methyl,

A is a single bond,—CONH alkylene-, -COOalkylene-, or phenylene group,

R_2 is hydrogen, alkyl or aryl, and

X^- is an acid group, said recurring units comprising at least 30 percent of the total units of said polymeric compound and said polymeric compound being present in said emulsion in an amount sufficient to reduce pressure marks during the processing of said element.

4,186,011

COLOR PHOTOGRAPHIC RECORDING MATERIAL

Joachim W. Lohmann, Kuerten; Erwin Ranz, and Martin Kupper, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 2, 1977, Ser. No. 847,851

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1976, 2650715

Int. Cl.² G03C *1/76*

U.S. Cl. 430—505 **4 Claims**

1. The color photographic recording material consisting of a layer support having applied to it a plurality of light-sensitive layers including

a red sensitive layer unit comprising two red sensitive silver halide emulsion layers of differing sensitivities, each layer containing a non-diffusible color coupler for producing a cyan dye, the more sensitive of which is further removed from the layer support than the less sensitive,

two green sensitive silver halide emulsion layers of differing sensitivities more removed from the layer support than said red sensitive layer unit, each of said green sensitive layers containing a non-diffusible color coupler for producing a magenta dye, the more sensitive of the green sensitive layers being further removed from the layer support than the less sensitive,

a non-light-sensitive yellow filter layer more removed from the layer support than said green sensitive silver halide emulsion layers,

one or more blue sensitive layers containing a non-diffusing yellow-forming coupler, and being located further removed from the layer support than said yellow filter layer,

wherein the improvement comprises a light insensitive layer of binder free from effective amounts of silver halide

arranged immediately above said more sensitive green sensitive silver halide emulsion layer

and containing a non-diffusible color coupler for producing a magenta dye.

4,186,012

LIGHT SENSITIVE COLOR PHOTOGRAPHIC MATERIAL CONTAINING DEVELOPMENT INHIBITOR RELEASING COUPLER

Heinrich Odenwalder, Cologne; Walter Puschel, Leverkusen, both of Fed. Rep. of Germany; Robert J. Pollet, Berchem, Belgium, and Erwin Ranz, Leverkusen, Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Fed. Rep. of Germany

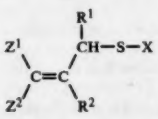
Filed Mar. 2, 1978, Ser. No. 882,631

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1977, 2709688

Int. Cl.² G03C *1/48, 1/06, 1/40, 5/30*

U.S. Cl. 430—544 **3 Claims**

1. A color photographic recording material comprising at least one light sensitive silver halide emulsion layer and containing in said light sensitive silver halide emulsion layer or in a light-insensitive binder layer associated thereto, a non-diffusible thioether compound capable of reacting with the oxidation product of a color developer compound containing a primary aromatic amino group, to release a diffusible substance which inhibits development of the silver halide, said non-diffusible thioether compound being a compound corresponding to the following formula or the corresponding tautomeric form:



wherein

X=an aliphatic group, an aromatic group or a heterocyclic group which on reaction with the color developer oxidation product, is released together with the sulfur atom of the thioether link to form a diffusible mercapto compound which inhibits the development of the silver halide;

Z^1=an electron attracting group selected from the group consisting of CN, COR^3 and SO_2R^3 where R^3 represents hydroxyl, alkyl, aryl, a heterocyclic group, alkoxy or amino,

Z^2, R^1 and R^2 represent hydrogen, alkyl, aryl, a heterocyclic group, alkoxy, alkylthio groups or groups as defined under Z^1, or

R^1 and R^2 together, Z^1 and Z^2 together or Z^2 and R^2 together represent the ring members required for completing a 5-membered or 6-membered carbocyclic or heterocyclic ring.

4,186,013

SILVER DIFFUSION TRANSFER RECEIVING LAYER COMPRISING HEC AND GELATIN

Edwin H. Land, Cambridge, and Stanley M. Bloom, Waban, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 4, 1978, Ser. No. 897,943

Int. Cl.² G03C *1/48;* **B44D** *1/30;* **C03C** *17/06, 21/00*

U.S. Cl. 430—228 **13 Claims**

7. A silver diffusion transfer film unit which comprises a

transparent support carrying, in order, a layer comprising noble metal silver-precipitating nuclei, gelatin and hydroxyethyl cellulose, wherein said nuclei are present at a level of about 0.1 to 0.4 mgs/ft^2; said gelatin at a level of about 0.05 to 1.5 mgs/ft^2 and said hydroxyethyl cellulose at a level of about 0.1 to 7 mgs/ft^2; a photosensitive silver halide layer; and an antihalation layer wherein said hydroxyethyl cellulose is present in an excess over said gelatin.

4,186,014

LIGHT SENSITIVE PHOTOGRAPHIC MATERIAL CONTAINING A MORDANT LAYER

Bergthaller, Peter, Cologne; Wulf von Bonin, Leverkusen; Gunter Helling, Siegburg, and Paul Marx, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 11, 1977, Ser. No. 814,148

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1976, 2631521

Int. Cl.^{2} G03C *1/40, 5/54;* **C08F** *18/24;* **B44D** *1/09*

U.S. Cl. 430—213 **2 Claims**

1. An image receptor element for the dye diffusion transfer process comprising a support and an image-receiving layer containing as mordant a reaction product of a crosslinking reaction between

a hydrophilic gelatin binder and a water-soluble cationic polymer obtained from a basic polyurethane, polyurea or polyurea polyurethane consisting of

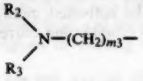
from 0 to 30 mols % of recurrent units derived from a modifying monomer selected from the group consisting of monofunctional and trifunctional alcohols, amines, and isocyanates and from 70 to 100 moles % of recurrent units of the general formula

$$[-A-B-]$$

in which segment A is derived from a diol, hydroxy alkylamine or diamine containing at least one tertiary amino group by removal of two terminal hydrogen atoms and corresponds to the general formula

$$-X_1-(CH_2)_{m1}-\underset{\displaystyle R_1}{\overset{|}{N}}-(CH_2)_{m2}-X_2-$$

R_1 represents individually or in combination, straight or branched chain alkyl, alkoxyalkyl, aralkyl, a disubstituted aminoalkyl group of the formula



or an ethylene or 1,2-propylene group which is attached to X_1 or X_2 through the second bond with formation of a piperazine ring,

R_2 and R_3 which may be the same or different represent alkyl groups selected from the group consisting of from 1 to 4 carbon atoms or together the atoms required to complete a pyrrolidine, piperidine or morpholine ring,

X_1 and X_2 which may be the same or different, represent —O—, —NH—, —NR_4— or a group of the formula —NR_4—$(CH_2)_{m4}$—X_3— in which

R_4 represents an alkyl group having from 1 to 4 carbon atoms or when only one of the groups X_1 or X_2 is —NR_4—$(CH_2)_{m4}$—X_3—, R_4 may together with R_1 form an ethylene or a 1,2-propylene group

X_3 represents —O—, —NH— or —NR_4— and may be the same as or different from X_1 and X_2; and

m_1 to m_4 represent 2 or 3, but in the case of m_1 or m_2 only the value 2 may occur when R_1 and R_4 together form an ethylene or 1,2-propylene group; and

wherein segment A contains up to 40% of the tertiary amino group-quaternized with a quaternizing agent carrying glycidyl groups, and the remainder of the tertiary amino groups

(i) quaternized with quaternizing agents absent glycidyl groups, or

(ii) neutralized with an acid, and in

which segment B is derived from a bis-chloroformate, a diisocyanate or an isocyanate prepolymer having two isocyanate end groups, and is represented by the formula

$$-CO-Y-CO-$$

Y represents, individually or in combination, —O—R_5—O— —NH—R_6—NH— or —NH—R_6—NH—CO—O—R_7—O—CO—NH—R_6—NH—;

R_5 represents individually or in combination an alkylene group unsubstituted or substituted by alkyl group or interrupted by ether oxygen atoms;

R_6 represents individually or selectively in combination an alkylene group unsubstituted or substituted with alkyl groups, a cycloalkylene group or an arylene group;

R_7 represents any divalent group not containing any other Zerewitinoff active group or a group capable of reacting with isocyanate groups, provided that

Y can represent —OR_5O only when X_1 or X_3 are not —O—.

2. A light-sensitive color photographic material comprising as integral constituents an image receptor element as claimed in claim 1 and a light-sensitive element containing at least one light sensitive silver halide emulsion layer and associated with said silver halide emulsion layer a non-diffusing dye-giving compound capable of releasing on development a diffusible dye in image distribution.

4,186,015

SILVER DIFFUSION TRANSFER RECEIVING LAYER COMPRISING GELATIN AND POLYVINYL ALCOHOL

Edwin H. Land, Cambridge, and Stanley M. Bloom, Waban, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 4, 1978, Ser. No. 897,942

Int. Cl.^{2} G03C *1/48;* **B44D** *1/09;* **C03C** *17/06, 21/00*

U.S. Cl. 430—231 **12 Claims**

7. A silver diffusion transfer film unit which comprises a transparent support carrying, in order, a layer comprising noble metal silver-precipitating nuclei, gelatin and polyvinyl alcohol, wherein said nuclei are present in a level of about 0.1 to 0.4 mgs/ft^2; said gelatin at a level of about 0.05 to 1.5 mgs/ft^2 and said polyvinyl alcohol at a level of about 0.1 to 5 mgs/ft^2; a photosensitive silver halide layer; and an antihalation layer; wherein said polyvinyl alcohol is present in an excess over said gelatin.

4,186,016

COLOR PHOTOGRAPHIC RECORDING MATERIAL

Joachim W. Lohmann, Kuerten; Otto Lapp, Leverkusen, and Immo Boie, Cologne, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Fed. Rep. of Germany

Filed May 17, 1977, Ser. No. 797,753

Claims priority, application Fed. Rep. of Germany, May 21, 1976, 2622923

Int. Cl.^{2} G03C *1/76, 3/00*

U.S. Cl. 430—506 **4 Claims**

1. The color photographic recording material consisting of

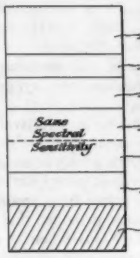
(a) a layer support having applied to it a plurality of light-sensitive and non-light-sensitive layers including

(b) at least two red sensitive silver halide emulsion layers of different speed each having associated with it a non-diffusing cyan-forming coupler, at least two green sensitive silver halide emulsion layers of different speed each having associated with it a non-diffusing magenta-forming

coupler, and one or more blue sensitive silver halide emulsion layers each of said one or more blue sensitive layers having associated with it a non-diffusing yellow-forming coupler, and being located further removed from the layer support than anyone of said red sensitive and green sensitive layers, and

(c) at least one non-light-sensitive yellow filter layer located closer to the layer support than any of said one or more blue sensitive layers,

the more sensitive of said red sensitive layers and the more sensitive of said green sensitive layers being combined to form a comparatively more sensitive emulsion layer unit which is located further removed from the layer support than the less



sensitive of said red sensitive layers and the less sensitive of said green sensitive layers, which are combined to form a comparatively less sensitive emulsion layer unit and so that the photographic material contains at least two emulsion layers of the red spectral region and at least two emulsion layers of the green spectral region wherein the improvement comprises a combination of the less sensitive and the more sensitive of the partial layers of a same spectral region are directly adjacent to each other without an intermediate layer, and the combination is arranged between the more sensitive and less sensitive of the partial layers of the other spectral region, so that the directly adjacent partial layers having the same spectral sensitivity permit intercoupling between the two partial layers.

4,186,017

LIGHT-SENSITIVE COPYING COMPOSITION

Roland Palmer, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 6, 1977, Ser. No. 830,771

Claims priority, application Luxembourg, Sep. 8, 1976, 75749

Int. Cl.[2] G03C *1/52, 1/68*

U.S. Cl. 430—162 **10 Claims**

1. A negative-working light-sensitive copying composition comprising a light-sensitive diazonium salt condensation product, an acid stabilizer, and a polyurethane prepolymer having from about 1 to 30 percent by weight of free terminal isocyanate groups.

4,186,018

SURFACE TREATMENT OF A SUPPORT MEMBER FOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Nobuhiko Minagawa, and Hiroyuki Kurabayashi, both of Fujimiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minamiashigara, Japan

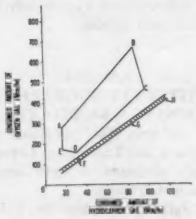
Continuation of Ser. No. 167,303, Jul. 29, 1971, abandoned. This application Oct. 29, 1975, Ser. No. 627,152

Claims priority, application Japan, Jul. 29, 1970, 45-66380

Int. Cl.[2] G03C *1/78*

U.S. Cl. 430—532 **5 Claims**

1. In a method for flame treating a polyolefinic surface of a support to be used as a support for a photographic light-sensitive material, to increase the adhesion between said surface and a subsequently-applied photographic emulsion layer, comprising treating said surface with a flame supported by a combustion gas which consists of a mixture of oxygen gas and a paraffinic or olefinic hydrocarbon gas at a temperature and for a period of time sufficient to achieve said increased adhesion, the improvement comprising obtaining excellent adhesion be-



tween said emulsion and said surface with substantially no fogging of the subsequently applied emulsion by treating said surface with a stable flame supported by a combustion gas having the composition within the area defined by points A, B, C, D, and D of FIG. 2.

4,186,019

COLOR PHOTOGRAPHIC MATERIAL CONTAINING NOVEL 2-EQUIVALENT YELLOW COUPLERS

Friedrich-Wilhelm Kunitz, and Heinz Salzmann, both of Leverkusen, Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Fed. Rep. of Germany

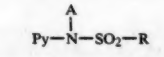
Filed May 18, 1978, Ser. No. 907,184

Claims priority, application Fed. Rep. of Germany, May 24, 1977, 2723301

Int. Cl.[2] G03C *1/40*

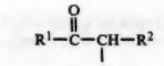
U.S. Cl. 430—557 **1 Claim**

1. Light sensitive material comprising at least one silver halide emulsion layer and in said silver halide emulsion layer or in a non-light-sensitive binder layer 2-equivalent yellow coupler which contains, in the coupling position, a nitrogen-containing group which can be split off in the coupling reaction, wherein the improvement comprises the 2-equivalent coupler is a compound represented by the following formula:



in which

A represents the group remaining after removal of a hydrogen atom from the activated methylene group of a 4-equivalent yellow coupler and corresponding to the formula

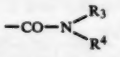


Py is a pyridine group connected to the N through one of its carbon atoms;

R represents alkyl with 1 to 10 carbon atoms, dialkylamino or aryl.

R^1 represents alkyl with 1 to 32 carbon atoms, alkoxyalkyl, cycloalkyl, or aryl

R^2 represents the group



R^3 represents hydrogen or alkyl with up to 4 carbon atoms

R^4 represents alkyl with 1 to 18 carbon atoms or aryl which may be substituted with one or more substituents selected from the group consisting of alkyl, aryl, aralkyl, aroxy, halogen, sulfo, carboxyl, acyl, acyloxy and acylamino.

4,186,020

FLUORESCENT INK FOR AUTOMATIC IDENTIFICATION

Joseph Wachtel, Buffalo Grove, Ill., assignor to A. B. Dick Company, Niles, Ill.

Continuation-in-part of Ser. No. 520,380, Nov. 4, 1974, abandoned. This application Jun. 1, 1976, Ser. No. 691,333

Int. Cl.[2] C09D *11/14*

U.S. Cl. 106—22 **11 Claims**

1. A fluorescent jet printing ink which is stimulated under ultraviolet light to an emission within the range of 500–700 nm consisting essentially of a solution having an electrical resistivity below 2000 ohm-cm comprising an organic solvent carrier in which the non-solvent components of the ink composition, which are dissolved in the organic solvent carrier, consist essentially of (1) solvent soluble organic phosphor, (2) solvent soluble organic brightener, (3) solvent soluble fluorescent dye components, (4) solvent soluble organic binder which does not interfere with the fluorescence of the fluorescent dye, and (5) an ionizable metal salt, and in which the binder is selected from the group consisting of a modified toluene sulfonamide, methyl cellulose, ethyl cellulose, acrylic and alkyl acrylic polymers in which the alkyl group contains from 1 to 5 carbon atoms, alcohol soluble butyrates, polyamide resins and shellac, the components being present in the amount within the range of 0.1 to 3% by weight of the organic phosphor, an amount up to 5% by weight of the organic brightener, up to 60% by weight of resinous binder, and 0.005 to 2.0% by weight of the fluorescent dye, the ionizable metal salt being present in an amount to maintain the electrical resistivity to below 2000 ohm-cm.

4,186,021

OXYNITRIDE GLASS-CERAMICS

Kenneth Chyung, Painted Post, and Raja R. Wusirika, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 896,355, Apr. 14, 1978, Pat. No. 4,141,739, which is a division of Ser. No. 843,972, Oct. 20, 1977, Pat. No. 4,097,295, which is a division of Ser. No. 735,313, Oct. 26, 1976, Pat. No. 4,070,198, which is a continuation-in-part of Ser. No. 664,263, Mar. 5, 1976, abandoned. This application Dec. 4, 1978, Ser. No. 966,193

Int. Cl.[2] C03C *3/22*

U.S. Cl. 106—39.6 **5 Claims**

1. A glass-ceramic article having a crystal content in excess of about 50% by volume wherein the predominant crystal phase is selected from the group consisting of a silica crystal, a silicate crystal, and/or a nitrogen-containing crystal, the composition of said article consisting essentially, by weight, of about 40–80% SiO_2, 3.5–17% N, said SiO_2 and N constituting at least 50% by weight of the composition, and at least 15% M_xO_y, wherein M_xO_y consists of about 10–40% Al_2O_3 and 5–25% of at least one oxide selected from the group consisting of the alkali metal oxides, the oxides of the elements of Group IIA and IIB of the Periodic Table, and B_2O_3.

4,186,022

SUPERHARD COMPOSITE MATERIAL

Sergei S. Ordanian; Vladislav S. Lysanov; Viktor V. Digonsky; Vadim A. Blinkov; Ljubov A. Pekelis; Vera I. Denisova; Vladimir I. Unrod; Sergei V. Sinelnikov, and Marina P. Chestnokova, all of Leningrad, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky Institut Abrazivov I Shlifovania and Leningradsky Politekhn Ichesky Institut Imeni Lensoveta, both of Leningrad, U.S.S.R.

Filed Jun. 15, 1978, Ser. No. 915,971

Int. Cl.[2] C04B *35/56, 35/58*

U.S. Cl. 106—43 **4 Claims**

1. A superhard composite material consisting essentially of cubic boron nitride and a binder consisting essentially of a carbide and a diboride of one metal selected from the group IV and V metals of the periodic system, said carbide and diboride present in eutectic ratio, said components being present in the following amounts:

	Per cent by weight
cubic boron nitride	28 to 80
carbide and diboride [of a metal selected from the group IV-V of the periodic system]	72 to 20

4,186,023

SEALING GLASS COMPOSITION

Maurice E. Dumesnil, Palo Alto, and Ulrich Schreier, San Francisco, both of Calif., assignors to Technology Glass Corporation, Sunnyvale, Calif.

Filed May 1, 1978, Ser. No. 901,467

Int. Cl.[2] C03C *3/12, 3/14, 3/30, 12/00*

U.S. Cl. 106—53 **9 Claims**

1. A sealing glass comprising a homogeneous mixture of lead oxide, zinc oxide, boron oxide, bismuth oxide, silicon dioxide, cuprous oxide and a minor proportion of at least one solid non-volatile metal fluoride, the proportions being lead oxide about 75 to 85 wt %, boron oxide about 8 to 15 wt %, zinc oxide up to 10 wt %, silicon dioxide 0.75 to 2.5 wt %, bismuth oxide to 5 wt %, cuprous oxide 0.5 to 5.5 wt % and non-volatile metal fluoride in amount such that the mol ratio of cuprous oxide to the fluoride content of the metal fluoride is in the range 1:0.25 to 1:10, said sealing glass being non-devitrifiable in that essentially no crystallization occurs when the glass is exposed to a temperature of 430° C. for a period of 15 minutes.

4,186,024

METHOD FOR IMPROVING WATER-RESISTANCE OF PULLULAN

Masanori Fujimoto, Ibaraki; Kosuke Fukami, Settsu; Kozo Tsuji, and Tsuneyuki Nagase, both of Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Hayashibara Biochemical Laboratories, Inc., Okayama, both of, Japan

Filed Jun. 3, 1976, Ser. No. 692,503

Claims priority, application Japan, Jun. 20, 1975, 50-76265

Int. Cl.[2] C08L *3/00, 3/02, 5/02*

U.S. Cl. 106—162 **20 Claims**

1. A composition which comprises pullulan and one or more dialdehyde polysacchrides soluble in water.

4,186,025

AQUEOUS POLYSACCHARIDE COMPOSITION

Kenneth S. Kang, LaJolla; George T. Veeder, III, and Danny D. Richey, both of San Diego, all of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 768,517, Feb. 14, 1977, which is a continuation of Ser. No. 616,733, Sep. 25, 1975, abandoned, which is a division of Ser. No. 373,724, Jun. 26, 1973, Pat. No. 3,933,788, which is a continuation-in-part of Ser. No. 197,941, Nov. 4, 1971, abandoned. This application Dec. 27, 1977, Ser. No. 864,298

Int. Cl.[2] C08L *5/00*; C09J *3/02, 3/18*

U.S. Cl. 106—162 1 Claim

1. A thickened aqueous composition that comprises an aqueous medium containing as a thickening agent from about 0.3% to about 3.0% by weight of Heteropolysaccharide-10, said heteropolysaccharide containing about 3% protein and about 97% carbohydrate, the carbohydrate portion of which contains about 19% of a uronic acid, about 39% glucose, about 29% galactose and about 13% fucose.

4,186,026

ABRASION-RESISTANT COATING COMPOSITION

Don H. Rotenberg, Westboro; Patricia M. Cuffe, Dudley, and Bernard L. Laurin, Ludlow, all of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Oct. 30, 1978, Ser. No. 956,008

Int. Cl.[2] C09K *3/00*

U.S. Cl. 106—287.14 5 Claims

1. A coating composition consisting of the hydrolysis product of

A. 20 to 50 wt. % tetraethylorthosilicate,

B. 37 to 60 wt. % of a silane selected from the group consisting of methyltrimethoxysilane, dimethyldimethoxysilane, ethyltriethoxysilane, diethyldiethoxysilane, ethyltrimethoxysilane and methyltriethoxysilane, and

C. 15 to 35 wt. % formalin.

4,186,027

PROCESSING OF KAOLINITIC CLAYS AT HIGH SOLIDS

David G. Bell, and Keith R. Gibson, both of St. Austell, England, assignors to English Clays Lovering Pochin & Company Limited, St. Austell, United Kingdom

Continuation-in-part of Ser. No. 764,380, Jan. 31, 1977, abandoned. This application May 30, 1978, Ser. No. 910,294

Claims priority, application United Kingdom, Oct. 7, 1976, 41817/76

Int. Cl.[2] C09C *1/42*

U.S. Cl. 106—288 B 7 Claims

1. A process for treating a raw kaolinitic clay mineral which comprises forming a fluid aqueous suspension of the kaolinitic clay mineral, said suspension having a solids content in the range of from about 60% to about 75% by weight and a pH in the range of from 7.5 to 10.5 and said suspension containing from 0.05 to 0.6% by weight of the dry clay of a dispersing agent system comprising from 2.5 to 7 parts by weight of a water-soluble condensed phosphate to 1 part by weight of a water-soluble organic polymeric dispersing agent; subjecting said suspension to a particle size separation technique at a temperature such that the viscosity thereof is less than 2 poise to reduce the percentage by weight of the particles larger than 10 μm in said suspension to not more than 3% by weight; and treating said 60% to 75% solids suspension with a water-soluble reducing bleaching agent at an alkaline pH in the range of pH 7.5 to 10.5 for a time sufficient to increase the brightness of the clay mineral, said process being carried out without the necessity for dewatering said suspension.

4,186,028

FLUID PIGMENT SUSPENSIONS WITH PHOSPHONOCARBOXYLIC ACIDS

Peter Woditsch; Gunther Teichmann; Gunter Linde; Gunter Lailach, all of Krefeld, and Fritz Rodi, Duisburg, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 30, 1978, Ser. No. 911,008

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1977, 2725210

Int. Cl.[2] C09C *1/02, 1/24, 1/36, 1/08*

U.S. Cl. 106—300 10 Claims

1. In an aqueous fluid dispersible pigment suspension containing a dispersion aid, the improvement which comprises employing as the dispersion aid about 0.01 to 1% by weight, based on pigment solids, of a phosphonocarboxylic acid or a salt thereof.

4,186,029

AQUEOUS DYESTUFF DISPERSIONS

Volker Aign, Monheim; Hans Schulze, Cologne; Fritz Bremer, Leverkusen; Reinhold Hörnle, Cologne; Karlheinz Wolf, Leverkusen; Wilhelm Berlenbach, Odenthal-Blecher, and Peter Rasche, Aachen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 19, 1978, Ser. No. 926,076

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1977, 2732732

Int. Cl.[2] C09D *7/12*

U.S. Cl. 106—308 Q 6 Claims

1. Aqueous dyestuff dispersions comprising water-insoluble dyestuff and a water-soluble oxyalkylation product obtained by condensation of 1 to 3 mols of styrene or vinyltolulene and 1 mol of phenol, reacted with 12 to 100 mols of ethylene oxide.

4,186,030

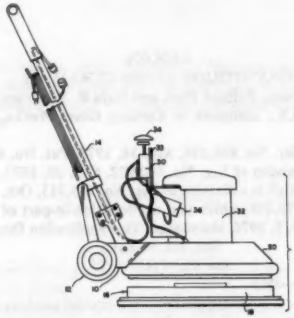
CARPET CLEANING

John L. Armstrong, 4482 Holly Dr., Palm Beach Garden, Fla. 33410

Continuation-in-part of Ser. No. 738,707, Nov. 4, 1976, Pat. No. 4,067,082. This application Nov. 18, 1977, Ser. No. 852,670

Int. Cl.[2] B08B *6/00*

U.S. Cl. 134—1 22 Claims



1. The method of cleaning an area of a pile carpet which comprises providing a cleaning pad in pressure contact with the pile surface of the carpet, providing a liquid cleaning solution at the area of the carpet being cleaned by moistening the carpet area or the cleaning pad or both, establishing rubbing contact between the cleaning pad and carpet pile, and simultaneously generating and accumulating a charge of static electricity between the carpet and pad of sufficient magnitude to force migration of dirt particles and soil materials into the pad.

4,186,031

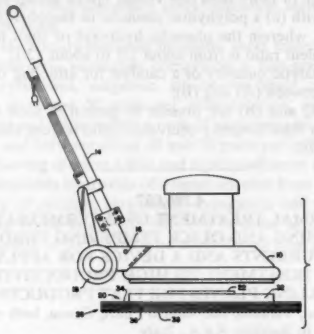
DRY CLEANING CARPETING

John L. Armstrong, 4482 Holly Dr., Palm Beach Garden, Fla. 53410, and Edward G. Tarkinson, 125 SE. 31st Ave., Boynton Beach, Fla. 33435

Continuation-in-part of Ser. No. 763,004, Jan. 27, 1977, Pat. No. 4,095,303. This application Dec. 5, 1977, Ser. No. 857,219

Int. Cl.[2] B08B *3/10, 6/00*

U.S. Cl. 134—1 **16 Claims**



1. The method of dry cleaning a pile carpet by induced static electricity which comprises

moistening an area of the carpet pile with an aqueous dry cleaning solution including a substantial proportion of a volatile hydrocarbon solvent,

providing a flat circular cleaning pad having a carpet-contacting surface having a coefficient of static friction with respect to the carpet pile effective to generate static electricity as a result of friction and contact between the pad and carpet,

electrically connecting condenser means between the carpet-contacting surface of the pad and ground,

rotating the pad in pressure contact with the carpet at a speed of several hundred RPM, and

providing a flow of static electricity from the pad to ground controlled by the condenser means.

4,186,032

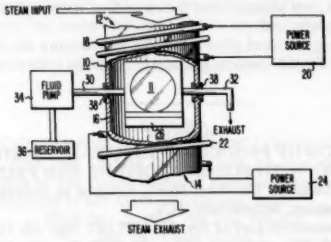
METHOD FOR CLEANING AND DRYING SEMICONDUCTORS

William E. Ham, Mercerville, N.J., assignor to RCA Corp., New York, N.Y.

Division of Ser. No. 726,058, Sep. 23, 1976, Pat. No. 4,079,522. This application Sep. 2, 1977, Ser. No. 830,030

Int. Cl.[2] B08B *7/04, 5/00*

U.S. Cl. 134—31 **1 Claim**



1. A method for cleaning and drying a surface of a semiconductor wafer comprising:

(a) providing a semiconductor wafer at an initial temperature below 100° C. and above 0° C.;

(b) placing the wafer against a holder having a low thermal mass, the holder having an inclined surface adapted to receive the wafer and adapted for the passage of cooling fluid therethrough;

(c) passing superheated steam over a surface of the wafer;

(d) condensing a portion of the superheated steam on the surface whereby a water condensate is formed;

(e) dripping the condensate from the inclined wafer for a preselected time;

(f) raising the temperature of the wafer above 100° C.; and

(g) removing the wafer to an environment below 100° C. after all water adjacent the wafer is evaporated.

4,186,033

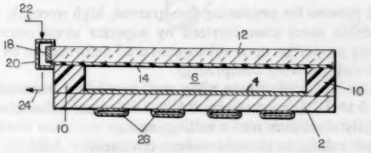
STRUCTURE FOR CONVERSION OF SOLAR RADIATION TO ELECTRICITY AND HEAT

Norman L. Boling, and Charles F. Rapp, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 1, 1978, Ser. No. 956,561

Int. Cl.[2] H01L *31/04;* **F24J** *3/02*

U.S. Cl. 136—89 FC **14 Claims**



1. In a flat form solar collector, for collecting and absorbing solar radiation and conversion of said radiation to heat, comprising (1) a flat thermal collector plate having an upper surface that has a high absorptivity, at least 0.8, for electromagnetic radiation of wave lengths of 0.3 to 2.1 microns and converts such radiation on absorption largely to heat and (2) one or two superimposed enclosed insulating spaces above said thermal collector plate, each space being defined by a light conducting plate, the whole being sealed or enclosed about the periphery to form one or two spaces above said thermal plate isolated from the ambient atmosphere, the improvement wherein at least the light conducting plate immediately above said thermal collector plate is a luminescent solar collector and concentrator comprising a radiation collection medium for receiving incident solar radiation, wherein said radiation collection medium is a composite structure comprising:

(a) a thin layer, containing at least one luminescent species capable of emitting luminescent radiation upon excitation with incident solar radiation, optically and physically coupled to

(b) a relatively thick radiation conducting layer having an index of refraction close to that of said thin layer, said radiation collection medium being (i) totally internally reflective of a major portion of said emitted luminescent radiation, (ii) transparent to a portion of said incident solar radiation including visible wavelengths and (iii) optically coupled, in a relatively small portion of the surface area of said thick layer, to a photovoltaic cell responsive to said emitted luminescent radiation,

said thin layer containing said luminescent species being within one of said enclosed insulating spaces,

whereby in operation a portion of said luminescent radiation is conducted to said solar cell to produce electricity, and unabsorbed solar radiation including visible wavelengths plus a minor portion of said luminescent radiation is transmitted to said thermal collector plate and largely converted to heat, and

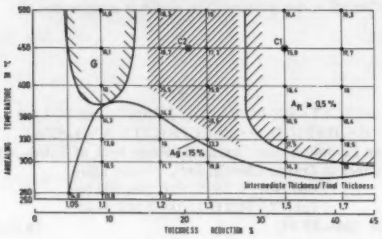
whereby said thin layer is protected from the ambient environment and from direct contact with said solar cell.

4,186,034

METHOD OF MANUFACTURING ALUMINUM ALLOY SHEETS CONTAINING MAGNESIUM AND ZINC

Rudolf Akeret, Lohningen, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Dec. 6, 1978, Ser. No. 966,649
Claims priority, application Switzerland, Jul. 5, 1978, 7324/78
Int. Cl.[2] C22F *1/04*
U.S. Cl. 148—2 **7 Claims**



1. A process for producing fine-grained, high strength, good formability sheet characterized by superior stress corrosion cracking properties upon subsequent cold deformation by deep and stretch drawing comprising:

A. casting an aluminum alloy melt consisting essentially of 4.0 to 7.0% magnesium, 0.5 to 2.0% zinc, balance essentially aluminum into a rolling ingot;

B. hot rolling to an intermediate thickness;

C. cold rolling to a final thickness;

D. annealing above the recrystallization temperature of said alloy so as to produce a grain size of less than 50 μm; and

E. cooling from said annealing temperature to a stabilization temperature of between 200° and 260° C. at a rate of less than 100° C. per hour, said alloy sheet being free from flow patterns and characterized by superior stress corrosion cracking properties upon subsequent cold deformation.

4,186,035

CHROMIUM CONTAINING COATING

William H. Cawley, Painesville, Ohio, and Edward A. Rowe, Jr., Cheshire, Conn., assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Oct. 16, 1978, Ser. No. 951,858
Int. Cl.[2] C23F *7/26, 7/10*
U.S. Cl. 148—6.16 **10 Claims**

1. A chromium-containing rinse composition adapted for application to a coated metal substrate, said composition comprising hexavalent chromium-containing compound, methylene chloride, and a substance selected from the group consisting of acetamide, N,N-dimethylformamide, acetone oxime and mixtures thereof, with the proviso that some to all of said hexavalent chromium-containing compound and said substance can be present in said composition as the reaction products thereof.

4,186,036

WELDABLE COATING COMPOSITIONS

William J. Elms, Lake Jackson, and Steven A. Weitzel, Richwood, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 25, 1978, Ser. No. 937,012
Int. Cl.[2] B44D *1/18*
U.S. Cl. 148—6.15 R **27 Claims**

1. In a weldable coating composition for metallic substrates which comprises in admixture a high molecular weight epoxy or phenoxy resin, an electroconductive pigment and an diluent; the improvement which comprises replacing at least about epoxy or phenoxy resin with a composition consisting essentially of:

(A) a low molecular weight epoxy resin or mixture of epoxy resins having an average of more than one vicinal epoxy group per molecule;

(B) a hydroxyl-containing or thiol-containing material or mixture of such materials which is (1) a polyhydric phenolic or thiophenolic compound or (2) the product of reacting (a) a low molecular weight epoxy resin having an average of more than one vicinal epoxy group per molecule with (b) a polyhydric phenolic or thiophenolic compound wherein the phenolic hydroxyl or thiol to epoxy equivalent ratio is from about 2:1 to about 12:1;

(C) a catalytic quantity of a catalyst for effecting the reaction between (A) and (B);

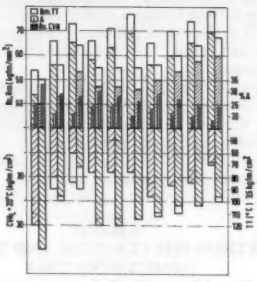
wherein (A) and (B) are present in quantities such that the hydroxyl or thiol to epoxy equivalent ratio is from about 0.5:1 to about 1.1:1.

4,186,037

THERMAL TREATMENT OF INTERMEDIATE QUENCHING AND QUICK TEMPERING THROUGH EDDY CURRENTS AND A DEVICE FOR APPLYING SAID TREATMENT TO HIGH PRODUCTIVITY ROLLING PLANTS FOR FLAT PRODUCTS

Carlo Parrini, Taranto, and Angelo Pozzi, Genoa, both of Italy, assignors to Italsider S.p.A., Italy

Filed Aug. 30, 1976, Ser. No. 718,969
Claims priority, application Italy, Sep. 12, 1975, 12790 A/75
Int. Cl.[2] C21D *1/10*
U.S. Cl. 148—12.4 **12 Claims**



1. A method of thermally treating a rolled steel plate, comprising:

receiving a rolled steel plate after it has been rolled to a final thickness;

developing a uniform temperature distribution within the rolled steel plate greater than a critical temperature of the steel plate; and

quenching the steel plate while the temperature distribution thereof is still uniform and still exceeds the critical temperature.

4,186,038

METHOD OF PRODUCING SILICON-IRON SHEET MATERIAL WITH BORON ADDITION, AND PRODUCT

Carl M. Maucione, Cheshire, Mass., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 677,147, Apr. 15, 1976, abandoned. This application Mar. 25, 1977, Ser. No. 781,119
Int. Cl.[2] H01F *1/04*
U.S. Cl. 148—113 **10 Claims**

1. The method of producing grain-oriented silicon-iron sheet of enhanced magnetic properties which comprises the steps of providing a fine-grained, primary-recrystallized, silicon-iron sheet containing 2.2 to 4.5 percent silicon, between about three

and 50 parts per million boron, amounts of manganese and sulfur within a ratio of manganese to sulfur less than 2.3, and between about 30 and 90 parts per million nitrogen in the ratio to boron of one to 15 parts per part of boron, covering the sheet with an adherent electrically-insulating coating containing boron in amount effective to cause secondary recrystallization of the silicon-iron sheet during final heat treatment, and subjecting the coated sheet to a final sheet heat treatment to develop (110) [001] secondary recrystallization texture in the silicon-iron sheet.

9. An electrically-insulated magnetic sheet material of enhanced magnetic properties comprising a fine-grained, primary-recrystallized, magnetic, silicon-iron sheet containing between three and 50 parts per million boron, amounts of manganese and sulfur within a ratio of manganese to sulfur less than 2.3, and between about 30 and 90 parts per million nitrogen and having thereon a thin and tightly-adherent coating of a water-insoluble hydroxide of a metal selected from the group consisting of calcium, magnesium, manganese and aluminum containing boron in amount effective to cause secondary recrystallization of the silicon-iron sheet during final anneal.

4,186,039

METHOD OF STABILIZING SPRINGS

John K. Bache, Blakeshall; Albert M. Sanderson, Penkridge, and Arthur Pearson, Halesowen, all of England, assignors to George Salter & Company, Limited, West Midlands, United Kingdom

Filed Nov. 17, 1977, Ser. No. 852,332
Int. Cl.[2] C21D *1/54*
U.S. Cl. 148—128 **7 Claims**

1. A method of treating a coil compression spring for improving its performance or reliability when operating at an elevated temperature, said method comprising the sequential steps of:

(a) stressing the spring by applying thereto a constant load of preselected magnitude and then,

(b) while application of said load is maintained at said preselected magnitude, heating the spring to a temperature which would cause adverse permanent changes in the physical characteristics of the spring material to cause it to commence to relax or collapse,

(c) maintaining the heating under said load until the relaxation or collapse of the spring has reached a predetermined value at which point the heating is discontinued automatically,

(d) upon discontinuing of heating step, immediately quenching said spring with a cooling medium while the spring remains stressed, and finally removing said load when the spring has cooled toward ambient temperature.

4,186,040

"BZ" CONTAINING PYROTECHNIC COMPOSITIONS

Gunter Aron, and Carl H. Hassis, both of Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 2, 1964, Ser. No. 415,512
Int. Cl.[2] C06B *45/10*
U.S. Cl. 149—19.4 **12 Claims**

1. A solid, pyrotechnic composition for dissemination of 3-quinuclidinyl benzylete, said composition consisting essentially of 3-quinuclidinyl benzylete and an oxidizer salected from the group consisting of ammonium and alkali metal chlorates and perchlorates, incorporated in a solid foamed polyurethane binder.

4,186,041

METHOD AND DEVICE FOR INSULATING COVERING OF CABLES

Vitaly L. Gantts, poselok Malakhovka, Mikhnevskoe shosse, 15/3, kv. 10, Ljubertsy Moskovskoi oblasti; Nikolai V. Krupenin, Baikalskaya ulitsa, 51, korpus 1, kv. 116, Moscow; Gennady I. Meschanov, ulitsa Mashtokova, 13, kv. 67, Podolsk Moskovskoi oblasti, and Izyaslav B. Peshkov, prospekt Mira, 184, korpus 2, kv. 146, Moscow, all of U.S.S.R.

Filed May 26, 1977, Ser. No. 800,614
Claims priority, application U.S.S.R., Jun. 4, 1976, 2359604[I]
Int. Cl.[2] B32B *31/26;* H01B *13/06*
U.S. Cl. 156—53 **3 Claims**

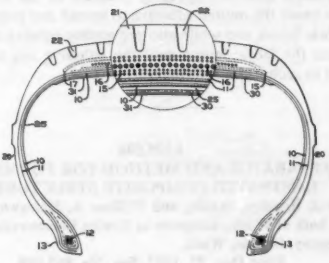
1. A method of insulating cables comprising the steps of applying a covering to the cable conductor in the form of tapes of polymer materials such as polytetrafluoroethylene and polyimide doubled with a copolymer of polytetrafluorothylene with hexafluoropropylene, subjecting the cable conductor to high-frequency heating in a transverse magnetic field for a period of time required to reach a temperature at which the covering tape material softens, and holding at this temperature within a longitudinal magnetic field, said holding time exceeding said heating time by 1/0.7 to 1/0.8 times.

4,186,042

PUNCTURE SEALING TIRE

Joe A. Powell, Norton; James W. Messerly, Stow, and Ronald L. Shippy, Brunswick, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 370,656, Jun. 18, 1973. This application Jul. 24, 1974, Ser. No. 491,443
Int. Cl.[2] B29H *17/02;* B60C *17/00*
U.S. Cl. 156—115 **2 Claims**



1. A method of making a puncture sealing cord-reinforced tubeless pneumatic tire which comprises assembling on a building drum the unvulcanized structural parts of a tire including at least an air-impervious liner layer inside of the reinforcing cord plies and another layer of comparable thickness comprising rubber containing a nitrogen generating blowing agent inside of the liner layer, shaping and vulcanizing the tire against an external mold by application of internal fluid pressure for bonding of the parts at a temperature at which the blowing

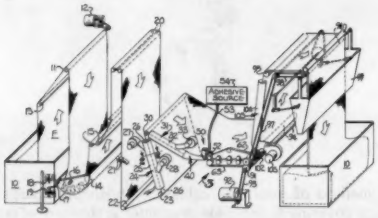
agent decomposes, and releasing the pressure while the vulcanized tire is still hot to cause expansion of the innermost layer to cellular rubber with its cells filled with nitrogen under pressure.

4,186,043

METHOD FOR HEMMING FABRIC USING A HOT MELT ADHESIVE

George E. Zeigler, Jr., Eden, N.C., and Henry S. Hutcherson, New Providence, N.J., assignors to Fieldcrest Mills, Inc., Eden, N.C.

Filed Feb. 17, 1978, Ser. No. 878,555
Int. Cl.[2] B32B *31/20*
U.S. Cl. 156—204 8 Claims



1. A method for continuously forming a longitudinal hem along one edge of a fabric using a hot melt adhesive for securement of the hem, said method comprising continuously advancing the fabric along a predetermined path of travel while directing one longitudinal edge portion of the fabric into and through a heating zone to preheat the longitudinal edge portion of the fabric and while directing the preheated longitudinal edge portion of the advancing fabric into and through a folding guide and folding the edge portion upon itself into overlying fabric layers to define a longitudinal hem along the edge of the fabric and while also applying heat to the folding guide to assist in maintaining the longitudinal edge portion of the fabric in a preheated condition as the fabric is advanced through and folded by the folding guide, applying a stream of molten hot melt adhesive between the overlying fabric layers of the thus folded preheated fabric, and immediately following the application of adhesive directing the hem into an elongate compression zone and applying pressure to the longitudinal hem to cause the molten adhesive to spread and penetrate into the fabric layers and while also preventing relative movement between the fabric layers until the adhesive has sufficiently cooled to secure the hem together.

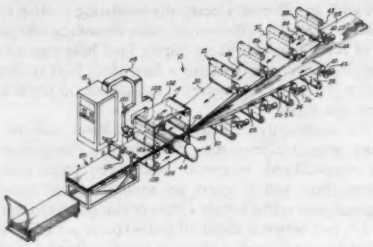
4,186,044

APPARATUS AND METHOD FOR FORMING LAMINATED COMPOSITE STRUCTURES

Robert J. Bradley, Seattle, and William A. Hainsworth, Bellevue, both of Wash., assignors to Boeing Commercial Airplane Company, Seattle, Wash.

Filed Dec. 27, 1977, Ser. No. 865,089
Int. Cl.[2] B29C *19/04;* B32B *19/02;* H05B *9/06*
U.S. Cl. 156—273 35 Claims

1. An apparatus for forming an elongated laminated structural member from a plurality of rolls of starting materials some of which contain uncured adhesive resins, the apparatus comprising: means for layering up material from rolls of starting material, slip means for feeding the layered material through a pressurized die in an energized microwave applicator chamber to cure an adhesive resin in the layered material to form an elongated laminated structural member, and pneumatic means for applying pressure through the die to the layered material while the slip means feeding the layered material



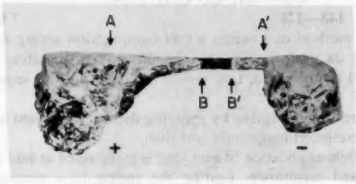
slides through the die in the chamber to control the dimensions of the laminate during the curing.

4,186,045

METHOD OF EPITAXIAL GROWTH EMPLOYING ELECTROMIGRATION

Harry C. Gatos, Weston, and Lubomir L. Jastrzebski, Somerville, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 717,828, Aug. 26, 1976, abandoned. This application Oct. 28, 1977, Ser. No. 846,651
Int. Cl.[2] B01J *17/04*
U.S. Cl. 156—602 24 Claims



1. A method of epitaxial growth of a material predominantly by electromigration, that comprises subjecting the substances from which said material is formed to a high temperature to create a liquid solution that includes the constituents of the material;

bringing a substrate in contact with the solution, there being a solute boundary layer in the solution immediately adjacent the substrate;

creating an electric field in the solution in an appropriate direction to cause electromigration of at least one of the solute and the solvent that constitute said solution to establish in the solution adjacent the interface between the solution and the substrate a supersaturated solution of said constituents which precipitate on the substrate at said interface by virtue of the condition of supersaturation and effect epitaxial growth thereon;

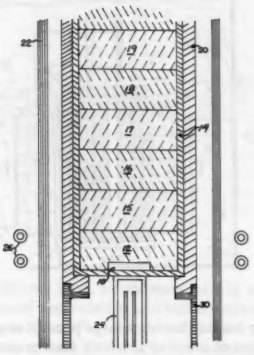
establishing and maintaining the parameters of the system at values at which growth is achieved mostly by virtue of said electromigration, said parameters comprising the temperature of the solution, the solute boundary layer thickness in the solution which is kept relatively large by minimizing convection in the solution, the thickness of the substrate and carrier concentration in the substrate, the thickness of the substrate being kept at a value which for the given system, and together with the other parameters of the system, renders the effect of the electromigration dominant and renders the effect of Peltier cooling insignificant; and

thereby epitaxially growing a layer on said substrate.

4,186,046
GROWING DOPED SINGLE CRYSTAL CERAMIC MATERIALS

A. Joseph DeLai, Reading, and Charles P. Gazzara, Medford, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 727,911, Sep. 29, 1976, abandoned. This application Nov. 28, 1977, Ser. No. 855,488
Int. Cl.[2] B01J *17/08, 17/20, 17/36*
U.S. Cl. 156—605 3 Claims



1. In a process for growing single crystals from ceramic materials selected from the group consisting of $Y_3Al_5O_{12}$, Al_2O_3, $MgAl_2O_4$ and eutectics of Al_2O_3/ZrO_2 and Al_2O_3-$/Y_3Al_5O_{12}$, and the dopant is selected from the group consisting of Nd^{+3}, Ho^{+3}, and Er^{+3} ions including the steps of seeding the melt of a ceramic material in a crucible, heating the material to above its melting point, and solidifying the melted material to form a single crystal by extracting heat from a bottom portion of the crucible, the improvement comprising introducing said ceramic material to said crucible in the form of a plurality of vertically stacked sintered billets, providing a quantity of dopant in said sintered billets during the preparation thereof, the amount of dopant to be provided being established by first determining the amount of dopant that will be rejected by each billet at the growth interface of the crystal and then providing an amount of dopant in each billet such that the amount of dopant retained by each billet after melting will be approximately equal, whereby a doped crystal having a uniform dopant concentration is formed, melting only a portion of the ceramic material by creating a molten zone at the bottom portion of the crucible, passing said zone up the crucible to progressively melt successive portions of said ceramic material within the crucible as each such portion corresponds to the position of said molten zone, each of said billets having a vertical dimension approximately equal to the vertical dimension of said molten zone and melting and solidifying said ceramic material in the presence of an inert gas.

4,186,047
SOLVENT REMOVAL FROM POLYMER SOLUTIONS

Emigdio J. Salmon, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 764,928, Feb. 2, 1977, abandoned. This application May 15, 1978, Ser. No. 905,825
Int. Cl.[2] B01D *1/22*
U.S. Cl. 159—2 E 4 Claims

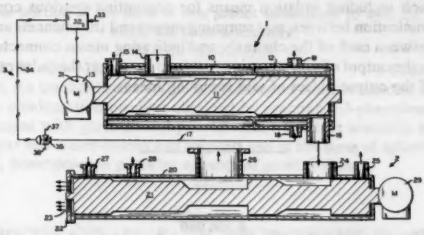
1. An apparatus for mechanically working a liquid mixture of a normally solid polymer and a solid comprising:

(a) an extruder having a barrel and a screw with a screw configuration coaxially and rotatably arranged within said barrel,

(b) a motor connected to said screw for rotating said screw within said barrel,

(c) at least one jacket surrounding said barrel at a location where during the process mechanical work is put into said liquid mixture,

(d) a source of cooling fluid connected to said jacket for circulating said cooling fluid through said jacket and to cool said barrel and to remove heat from said liquid mixture being in said location of mechanical working during the process,



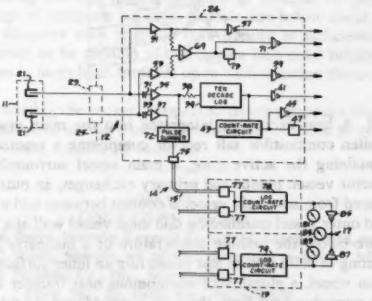
(e) a sensing means which senses the power surging of the motor driving said screw and generates a surge signal representative of the average power surging of said motor, and

(f) control means controlling at least one of the flow rate and the temperature of said cooling fluid responsive to said surge signal such as to increase the heat withdrawal from the fluid in the extruder when the power surging is higher than a given setpoint and to decrease the heat withdrawal from the fluid in the extruder when the power surging is lower than a given setpoint.

4,186,048
NEUTRON FLUX MONITORING SYSTEM

Harold A. Thomas, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Continuation-in-part of Ser. No. 720,747, Sep. 7, 1976, abandoned. This application May 2, 1977, Ser. No. 792,507
Int. Cl.[2] G21C *17/00*
U.S. Cl. 176—19 J 9 Claims



1. In a nuclear reactor system having a first subsystem for monitoring the neutron flux in the core of the nuclear reactor in the intermediate and power operation ranges of the reactor, comprising a plurality of neutron flux detector assemblies, each providing, on a respective output channel, at least one pulsed output signal at a pulse rate corresponding to detected neutron flux, and signal processing means for providing, for each channel, an indication of neutron flux in the intermediate and power operation ranges of the reactor, and having a second subsystem for monitoring the neutron flux in the core of the nuclear

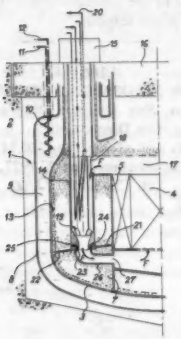
reactor in the source range and during the shutdown condition, the improvement wherein said second subsystem comprises summing means responsive to pulsed input signals to provide a pulsed output signal corresponding to the sum of the input pulses thereof at frequencies in the source range and the shutdown condition range, a plurality of coupling means, each connecting a respective one of the output channels to said summing means for providing pulsed signals thereto substantially corresponding to the pulsed output signals provided by the corresponding detector assembly, said coupling means each including isolation means for preventing spurious communication between said summing means and the channels and between each of the channels, and indicating means connected to the output of said summing means to represent the pulse rate of the output pulses of said summing means.

4,186,049

HEAT EXCHANGER INTEGRATED INTO THE MAIN VESSEL OF A MOLTEN COMBUSTIBLE SALT REACTOR

Jacques M. Blum, Levallois-Perret, and Edmond Ventre, Le Vesinet, both of France, assignors to Electricite de France (Service National) & Pechiney Ugine-Kuhlman, France

Filed Jul. 14, 1977, Ser. No. 815,773
Claims priority, application France, Jul. 22, 1976, 76 22394
Int. Cl.[2] G21C *3/54, 15/00*
U.S. Cl. 176—38 **6 Claims**



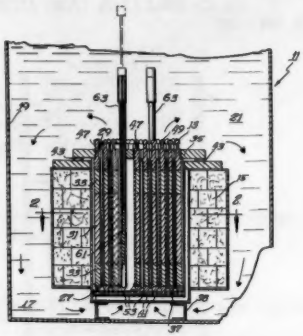
1. A heat exchanger integrated into the main vessel of a molten combustible salt reactor comprising a reactor vessel containing the active core, a main vessel surrounding said reactor vessel, pumps and primary exchanges, an outer vessel spaced from said main vessel, a coolant between said main and said outer vessel maintaining said main vessel wall at a temperature below the melting temperature of a nuclearly inactive coating of solid salt on and protecting an inner surface of said main vessel, a plurality of autonomous heat transfer modules for removing heat from the core, each of said modules comprising a primary exchanger and a pump, each of said modules being suspended in the space between said main vessel and said reactor vessel, the improvement comprising a first bearing surface at the base of each of said modules, a horizontally extending plate secured around the lower end of said reactor vessel extending toward and spaced from said main vessel and ending in said coating of solid salt, an opening in said plate for each of said modules and a second bearing surface around each of said openings supporting the adjacent one of said first bearing surfaces.

4,186,050

NUCLEAR REACTORS

Gordon B. West, Rancho Santa Fe, and Ralph H. Peters, Encinitas, both of Calif., assignors to General Atomic Company, San Diego, Calif.

Filed May 22, 1978, Ser. No. 908,065
Int. Cl.[2] G21C *3/58*
U.S. Cl. 176—62 **4 Claims**



1. A nuclear reactor having a large prompt negative temperature coefficient of reactivity, which reactor comprises

a reactor tank,

a quantity of water in said tank which serves both as coolant and as moderator,

a reactor core assembly within the water in said tank which includes a plurality of fluid-tight fuel elements which are spaced within said tank to provide liquid-flow passageways surrounding each of said elements,

means for permitting water to flow through said passageways in heat-exchange relationship with the surfaces of said elements,

each of said elements containing a solid homogeneous mixture of zirconium hydride, uranium and erbium,

wherein the improvement comprises,

said uranium constituting between about 20 and about 50 weight percent of said mixture, said zirconium hydride constituting between about 79 and about 50 weight percent of said mixture and said erbium constituting between about 0.5 and about 1.5 weight percent of said mixture,

said uranium in said mixture being not greater than about 20 percent U-235 with the remainder substantially U-238, the ratio of hydrogen atoms to zirconium atoms being between about 1.5:1 and about 1.7:1, and said erbium being distributed uniformly throughout said uranium-zirconium hydride mixture.

4,186,051

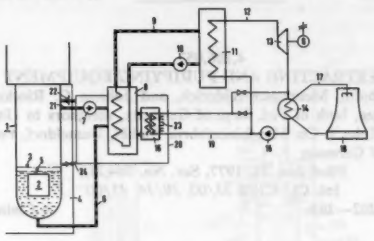
NUCLEAR ENERGY PLANT WITH IMPROVED DEVICE FOR REMOVING AFTER-HEAT AND EMERGENCY HEAT

Enno Buscher, Bergisch Gladbach, and Kurt Vinzens, Overath, both of Fed. Rep. of Germany, assignors to Interatom, Internationale Atomreaktorbau GmbH, Bergisch Gladbach, Fed. Rep. of Germany

Filed May 11, 1977, Ser. No. 795,852
Claims priority, application Fed. Rep. of Germany, May 13, 1976, 2621258
Int. Cl.[2] G21C *15/00, 9/00;* G12D *5/00*
U.S. Cl. 176—65 **7 Claims**

1. Nuclear energy installation comprising a nuclear reactor core, a primary circulatory loop connected to the reactor core and having a circulating liquid metal medium therein heated by the reactor core, a first heat exchanger having a primary side connected in said primary circulatory loop, and a secondary

side, a secondary circulatory loop connected to said secondary side of said first heat exchanger and having a circulating liquid metal medium therein heated by heat transfer in said first heat exchanger from the liquid metal medium of said primary circulatory loop, a second heat exchanger having a primary side connected in said secondary circulatory loop, and a secondary side, a tertiary circulatory loop connected to said secondary side of said second heat exchanger and having a circulating water/steam medium therein heated by heat transfer in said second heat exchanger from the liquid metal medium of said



secondary circulatory loop, a condenser having a vapor/condensate side thereof connected in said tertiary circulatory loop, and a coolant side thereof connectible to a heat sink separate from said condenser, said heat sink being disposed outside the installation, a third heat exchanger having a primary side connected in said primary circulatory to the primary side of said first heat exchanger, and having a secondary side, a quaternary coolant loop separate from said tertiary circulatory loop, said quaternary being connected to said secondary side of said third heat exchanger and connectible through said condenser to said heat sink.

4,186,052

NADH PEROXIDASE FOR HYDROGEN PEROXIDE DETERMINATION

Albert Röder, Seeshaupt; Hans Möllering, Tutzing; Wolfgang Gruber, Tutzing-Unterzeismering; Klaus Beaucamp; Hans Seidel, both of Tutzing; Peter Stahl, Bernried, and Detlef von Hoerschelmann, Wielenbach, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim Waldhof, Fed. Rep. of Germany

Filed Jun. 29, 1977, Ser. No. 811,422

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1976, 2633728

Int. Cl.[2] C07G *7/02*; G01N *31/14*; C12D *13/10*

U.S. Cl. 435—28 **9 Claims**

1. Process for the production of peroxidase for reduced nicotinamide-adenine-dinucleotide comprising liberating the enzyme from *Streptococcus faecalis* ATCC 8043 by digestion or by treatment with a surface-active agent and isolating said peroxidase from the enzyme solution obtained, said isolated peroxidase being characterized by a Michaelis constant K_m to hydrogen peroxide of 2.8×10^{-5} M and to reduced nicotinamide-adenine-dinucleotide of 1.7×10^{-5} M. measured at 25° C. in 0.2 M tris buffer of pH 6.0, containing 0.1 M potassium acetate.

4,186,053

INSOLUBILIZED ENZYME PRODUCT

Victor Krasnobajew, Zollikerberg, and Regula Boeniger, Greifensee, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 605,965, Aug. 19, 1975, which is a continuation-in-part of Ser. No. 571,187, Apr. 24, 1975, abandoned, which is a division of Ser. No. 440,438, Feb. 7, 1974, abandoned. This application Aug. 3, 1977, Ser. No. 821,662

Claims priority, application Switzerland, Feb. 23, 1973, 440438/73

The portion of the term of this patent subsequent to Jan. 13, 1995, has been disclaimed.

Int. Cl.[2] C07G *7/02*

U.S. Cl. 435—180 **1 Claim**

1. An insolubilized enzyme comprising an enzyme bonded to the condensation product obtained by reacting 1,3-phenylene diamine with glutardialdehyde, to form a product insoluble in water and water-immiscible solvents and in the form of spherical, homogeneous particles capable of good filtration.

4,186,054

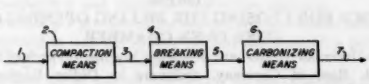
PROCESS AND APPARATUS FOR PRODUCING BLAST FURNACE COKE BY COAL COMPACTION

William E. Brayton, Penn Hills Township, Allegheny County; Fay Fun, Monroeville; Luther G. Hendrickson, Churchill, and Ronald W. Shoenberger, Monroeville, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 30, 1977, Ser. No. 865,818

Int. Cl.[2] C10B *53/08*

U.S. Cl. 201—6 **24 Claims**



1. A method of producing blast furnace coke comprising:

(a) compacting a finely divided coal comprising a majority of coking coal and wherein at least about 60% by weight of the coal has a diameter of less than about ¼ inch to form a coal compact, said compact immediately after removal from the compacting step comprising at least about 20% by weight of particles having a particle size of less than about ¼ inch in diameter;

(b) breaking the thus formed compact to increase the percentage of compacts having a particle size below about ¼ inch diameter such that the bulk density is sufficiently increased to be capable of conversion into coke suitable for use in large blast furnaces upon carbonization thereof; and

(c) carbonizing the broken compact to thereby produce blast furnace coke having a minimum hardness of about 68 and a minimum stability of about 55.

4,186,055

COKE OVEN DOOR

William R. Baird, Sturgis; Kenneth O. Sutton, Morganfield, and Billy C. Baird, Sturgis, all of Ky., assignors to Saturn Machine & Welding Co., Inc., Sturgis, Ky.

Filed Jun. 26, 1978, Ser. No. 918,834

Int. Cl.[2] C10B *25/06, 25/16*

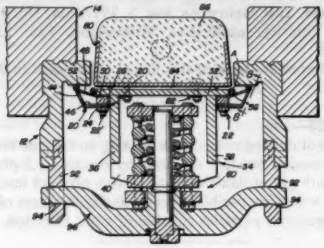
U.S. Cl. 202—248 **9 Claims**

1. A coke oven door mounted on a coke oven doorjamb, said door comprising, in combination:

(A) a main frame; and

(B) seal means mounted on said main frame for providing a tight, uniform and non-sticking seal between said main frame and said oven doorjamb, said sealing means including a sealing knife edge element mounted on said main frame and arrangeable coextensive with said doorjamb; said sealing knife edge element extending cantilever fash-

ion from said main frame to a free end of said edge element; and support means mounted on said main frame for exerting a uniform bias along an entire extent of said sealing knife edge element with said support means including a sealing edge support member anchored to and extending cantilever fashion away from said main frame and connected to said sealing knife edge element adjacent the



free end of the edge element, the edge of said sealing edge support member applying a resilient force upon said free end of said sealing edge element and approaching the abuttable surface of said doorjamb at an angle of approximately 25 degrees said sealing knife edge element extending away from said main frame and terminating at an angle of approximately 25 degrees with respect to the abuttable surface of said doorjamb.

4,186,056

DEVICE FOR CLOSING THE FILLING OPENING OF A COKE OVEN CHAMBER

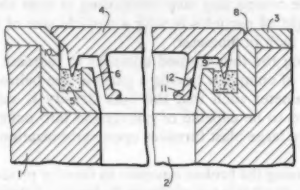
Hans-Hermann Müller, and Johannes Wulfmeier, both of Essen, Fed. Rep. of Germany, assignors to Didier Engineering GmbH, Essen, Fed. Rep. of Germany

Filed Jul. 10, 1978, Ser. No. 923,405

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1977, 2732245

Int. Cl.[2] C10B *25/20*

U.S. Cl. 202—250 **8 Claims**



1. A closing device for closing a filling opening extending through the ceiling of a coke oven chamber, said closing device comprising:

a frame having an opening therethrough, said frame adapted to be positioned on a coke oven chamber ceiling with said opening of said frame aligned with a filling opening of the coke oven chamber ceiling, said frame having formed therein a recessed duct surrounding said opening;

a filling opening cover adapted to close said opening, said cover having extending therefrom a substantially annular projection;

said duct having therein a displaceable pulverulent material which is capable of being displaced by said projection;

such that when said cover is positioned over said frame, said projection extends into said displaceable pulverulent material, thereby forming a first seal closing said filling opening; and

said frame having a first inclined sealing surface positioned radially outwardly of said duct, said cover having a second inclined sealing surface positioned radially outwardly of said projection, said first and second inclined sealing surfaces inclining downwardly and inwardly towards the center of the frame opening and being in mutually abutting contact when said projection extends into and displaces said displaceable pulverulent material, thereby forming a second seal which surrounds said first seal and which prevents debris from passing between said cover and said frame into said duct.

4,186,057

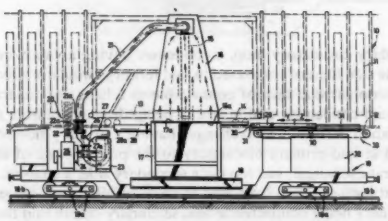
GAS EXTRACTING AND PURIFYING EQUIPMENT

Fritz Schulte, Meerbusch-Büderich, and Johann G. Riecker, Ratingen, both of Fed. Rep. of Germany, assignors to Hartung, Kuhn & Co. Maschinenfabrik GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Jan. 31, 1977, Ser. No. 764,215

Int. Cl.[2] C10B *33/00, 39/14, 45/00*

U.S. Cl. 202—263 **6 Claims**



1. Equipment for receiving and transporting red-hot coke from an oven chamber of a coke oven and for extracting and purifying the dust-containing gases rising from the coke comprising an upwardly open coke container and a coke container truck supporting same, a coke batch-conveying truck having an overhanging extractor hood, the interior of said coke batch-conveying truck communicating with the interior of said extractor hood, means for driving each of said coke container truck and coke batch-conveying truck parallel to the coke oven and relative to each other, means for temporarily sealingly engaging said coke container with said overhanging extractor hood, cover means disposed adjacent to and out of contact with said coke container and means for moving said cover means to cover said coke container when the coke container is moved out of sealing engagement with said extractor hood, extracting and purifying means located on the container truck for extracting and purifying dust-containing gases, and conduit means for connecting said extracting and purifying means alternately between (1) the interior of the uppermost portion of the extractor hood when the hood is in sealing engagement with said coke container on said container truck to permit extracting and purifying dust-containing gases therefrom and (2) the interior of the uppermost portion of the coke container on said container truck when said coke container is moved out of sealing engagement with said extractor hood and is covered with said cover means, said conduit means including (a) first and second duct means for receiving said gases from said extractor hood and from said coke container, respectively, and (b) means for (1) closing off flow to said extracting and purifying means through said second duct means and leaving the first duct means open when the extractor hood is in sealing engagement with said coke container and (2) closing off flow to said extracting and purifying means through said first duct means and opening said second duct means when the coke container is moved out of sealing engagement with said extractor hood and is covered with said cover means.

4,186,058
METHOD AND APPARATUS FOR HIGH VOLUME DISTILLATION OF LIQUIDS

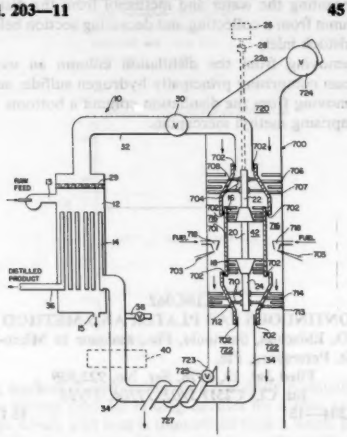
Jerome Katz, and Sidney J. Fogel, both of Rochester, N.Y.

Continuation-in-part of Ser. No. 681,290, Apr. 28, 1976, Pat. No. 4,035,243, and Ser. No. 769,291, Feb. 22, 1977. This application Apr. 18, 1977, Ser. No. 787,832

The portion of the term of this patent subsequent to Jul. 12, 1994, has been disclaimed.

Int. Cl.[2] C02B *1/04;* B01D *1/28*

U.S. Cl. 203—11 **45 Claims**



1. A method for high volume distillation of impure liquids comprising the steps of:

(a) evaporating said impure liquid in an evaporator to form a vapor at a temperature above the freezing point and below the critical temperature of said liquid and at a pressure not exceeding a pressure corresponding to said evaporation temperature under saturated conditions;

(b) compressing said vapor such that the ratio of vapor pressure of said vapor following compression to evaporated liquid vapor pressure is in the range 1.2:1 to 250:1;

(c) adding sufficient energy to operate said compression step at least a portion of said energy being added by passing a hot gas through a means for expanding said gas whereby at least a portion of the energy is produced for operating said compression step, said hot gas comprising at least in part a gas other than said vapor produced in subparagraph (a) hereof;

(d) cooling said vapor in heat transfer relation with said impure liquid whereby said vapor at least partially condenses, transferring sufficient heat to said impure liquid for evaporating at least a part of said liquid and to form a vapor therefrom having said temperature and pressure characteristics set forth in sub-paragraph (a) hereof; and

(e) collecting said condensed vapor.

4,186,059
DEHYDRATION OF SOLVENT USED IN OIL DEWAXING-DEOILING PROCESSES

Raymond N. Fleck, West Covina, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Feb. 13, 1978, Ser. No. 877,117

Int. Cl.[2] B01D *3/00;* C01G *43/08*

U.S. Cl. 203—14 **6 Claims**

1. A process for dehydrating an essentially one-phase liquid feed stream consisting of water, methyl ethyl ketone, and toluene, said liquid feed stream comprising at least 60% by volume toluene, which process comprises:

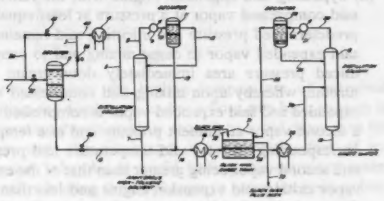
(a) fractionally distilling said liquid feed stream so as to obtain an anhydrous solvent stream consisting essentially of toluene and methyl ethyl ketone and a vapor stream containing water, toluene, and methyl ethyl ketone;

(b) condensing said vapor stream, thereby obtaining a two-phase condensate comprising a water-lean phase containing toluene and a water-rich phase containing methyl ethyl ketone but essentially no toluene;

(c) recycling said water-lean phase to step (a) as reflux;

(d) extracting into a hydrocarbon stream some of the methyl ethyl ketone, but essentially none of the water, contained in said water-rich phase and the portion of the condensed azeotropic mixture recycled from step (h);

(e) recovering from step (d) a second water-rich phase containing that portion of the methyl ethyl ketone not extracted into said hydrocarbon stream;



(f) azeotropically distilling said second water-rich phase so as to obtain liquid water and a vaporous fraction consisting of an azeotropic mixture of water and methyl ethyl ketone;

(g) condensing said vaporous azeotropic mixture;

(h) recycling a portion of the condensed azeotropic mixture obtained in step (g) to step (d) and the remaining portion to step (f) as reflux; and

(i) recovering an anhydrous solvent stream consisting essentially of toluene and methyl ethyl ketone from step (a), a hydrocarbon stream containing methyl ethyl ketone but no water from step (d), and a liquid water stream from step (f).

4,186,060
METHOD AND APPARATUS FOR HIGH VOLUME DISTILLATION OF LIQUIDS

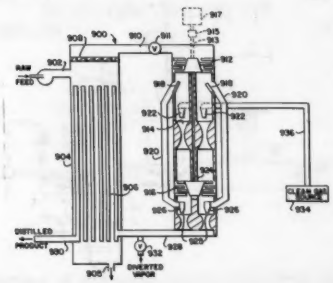
Jerome Katz, and Sidney J. Fogel, both of Rochester, N.Y.

Continuation-in-part of Ser. No. 681,290, Apr. 28, 1976, Pat. No. 4,035,243. This application Feb. 22, 1977, Ser. No. 769,291

The portion of the term of this patent subsequent to Jul. 12, 1994, has been disclaimed.

Int. Cl.[2] B01D *1/28;* C02B *1/04*

U.S. Cl. 203—26 **26 Claims**



1. A method for high volume distillation of impure liquids comprising the steps of:

(a) evaporating said impure liquid in an evaporator to form a vapor at a temperature above the freezing point and

below the boiling point of said liquid at ambient pressure and at a pressure not exceeding a pressure corresponding to said evaporation temperature under saturated conditions;

(b) compressing said vapor to a predetermined pressure such that the ratio of vapor pressure of said vapor following compression to evaporated liquid vapor pressure is in the range of 1.1:1 to 200:1;

(c) passing a portion of said compressed vapor at said predetermined pressure through an expansion engine, said vapor doing work on said engine to motivate said engine and to produce shaft energy whereby said vapor expands and cools, said portion comprising from 0.01 to 99.9% by weight of said compressed vapor flow;

(d) bypassing said expansion engine with the remainder of said compressed vapor at a pressure at least equal to said predetermined pressure and injecting said remainder into said expanded vapor to cause mixing and to create a reduced pressure area immediately downstream of said turbine, whereby upon mixing said compressed vapor is expanded and said expanded vapor is compressed to form a second vapor at ambient pressure and at a temperature corresponding thereto, said temperature and pressure of said second vapor being greater than that of the expanded vapor exiting said expansion engine and less than that of the remainder of said compressed vapor prior to admixing;

(e) adding make-up work to said expansion engine to supplement the work done on said engine by said vapor expanding therethrough, said added work being sufficient to at least make-up for work lost when said remainder of said compressed vapor bypassed said expansion engine;

(f) cooling said second vapor in heat transfer relation with said impure liquid whereby said vapor at least partially condenses, transferring sufficient heat to said impure liquid for evaporating said liquid and to form a vapor therefrom having said temperature and pressure characteristics set forth in sub-paragraph (a) hereof; and

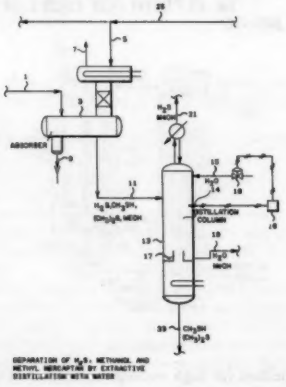
(g) collecting said condensed vapor.

4,186,061

FRACTIONATION OF METHYL-MERCAPTAN REACTOR EFFLUENT

Dale A. Zellers, and Joseph W. Clark, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 24, 1977, Ser. No. 809,831
Int. Cl.[2] C07C *148/04*
U.S. Cl. 203—96 **3 Claims**



1. A method for separating a feedstock comprising hydrogen sulfide, methyl mercaptan, methanol, and water to obtain minimum water in the overhead and bottoms streams, said method comprising:

(a) introducing said feed stock into a fractional distillation column having a heated kettle and a cooled overhead;

(b) introducing sufficient water into the column above the feedstock inlet to maintain a molal ratio of water to methanol of at least 10:1 in the distillation column between the water inlet and the point for water and methanol decanting;

(c) decanting the water and methanol from the distillation column from a collecting and decanting section below the feedstock inlet;

(d) removing from the distillation column an overhead stream comprising principally hydrogen sulfide; and

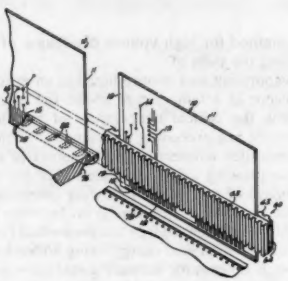
(e) removing from the distillation column a bottoms stream comprising methyl mercaptan.

4,186,062

CONTINUOUS TAB PLATER AND METHOD

Charles D. Eidschun, Seminole, Fla., assignor to Micro-Plate, Inc., St. Petersburg, Fla.

Filed Jul. 13, 1978, Ser. No. 923,939
Int. Cl.[2] C25D *5/02, 17/06, 17/28*
U.S. Cl. 204—15 **16 Claims**



1. In the method of plating printed circuit board connector tabs of the type characterized by the sequential stripping of tin lead, rinsing, and plating with nickel, and gold, or other metals atop the underlying copper base of the connector tab, the improved steps of:

providing an opposed and abutting pair of endless moving belts of non-absorbtive material,

providing mechanical means for adjustably pressing said endless belts each against the other,

compressively engaging a series of printed circuit boards between said belts thereby providing a line of demarcation, lying on said boards adjacent to and above the connector tabs, in registration with the lower edge of said abutting endless belts,

maintaining the compressive relationship of the belts to the printed circuit boards while transporting the unmasked area of the board below said line of demarcation through a plating cell,

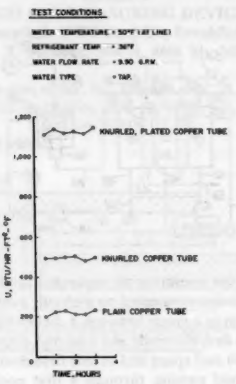
providing a turbulent flow of electrodeposition fluid by reversing the flow of the fluid exiting a flow system adjacent the unmasked contact tabs,

whereby the provision of a reverse flow creates an area of turbulence extending to the line of demarcation.

4,186,063
BOILING HEAT TRANSFER SURFACE, METHOD OF PREPARING SAME AND METHOD OF BOILING

Clarence E. Albertson, Villa Park; George M. Nichols, Evanston, and John N. Rasmussen, Des Plaines, all of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 1, 1977, Ser. No. 847,637
Int. Cl.[2] C25D 5/34
U.S. Cl. 204—29 3 Claims



1. A method of manufacturing a thermally conductive wall surface having nucleate boiling cavities for a heat exchanger through which wall heat is transmitted from a warm fluid to a boiling liquid comprising the steps of (1) mechanically forming non-continuous pits or craters on the surface of said wall; (2) electrodepositing a metal on the thus pitted surface at a high current density to produce dendrites and form honeycomb-like nucleate boiling surfaces on said conductive wall surface; and (3) subsequently plating said dendrites at a lower current density to coat said dendrites with a metal plate.

4,186,064
METHOD AND ELECTROLYTE FOR ELECTRODEPOSITION OF BRIGHT GOLD AND GOLD ALLOYS

Ronald J. Morrissey, Cranston, R.I., assignor to Technic, Inc., Providence, R.I.

Continuation-in-part of Ser. No. 817,200, Jul. 20, 1977, abandoned. This application Jul. 10, 1978, Ser. No. 922,981
Int. Cl.[2] C25D 3/48, 3/62
U.S. Cl. 204—43 G 16 Claims

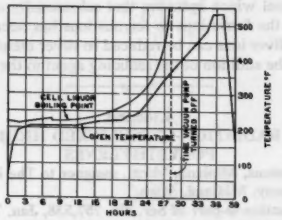
1. In an electroplating bath for the deposition of bright gold or gold alloy electrodeposits, comprising an aqueous solution of a soluble gold cyanide, supporting electrolyte and brightening agent, buffered to a pH of about 4.5–6.0, the improvement which comprises employing as said brightening agent, at least one fully neutralized potassium, sodium, or ammonium salt of the codepositable metal chelate of an organophosphorus chelating agent, wherein said codepositable metal is cobalt or nickel.

4,186,065
METHOD OF PREPARING A RESIN-CONTAINING ASBESTOS DIAPHRAGM

Colonel R. Dilmore, New Martinsville; Edsel V. Hoover, Paden City, and Allan B. Kriss, New Martinsville, all of W. Va., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 27, 1978, Ser. No. 900,456
Int. Cl.[2] C25B 1/16, 1/26, 13/06, 13/08
U.S. Cl. 204—98 69 Claims

1. In a method of preparing a resin containing asbestos diaphragm comprising the steps of depositing asbestos fibers and resin from an aqueous slurry comprising alkali metal chloride, alkali metal hydroxide, asbestos fibers, and resin onto a liquid permeable cathode member and thereafter heating the deposited asbestos fibers and resin to cause the resin to bind the asbestos fibers together, the improvement comprising maintaining forced convective flow of air through the diaphragm at



a temperature below the boiling temperature of entrained water within the diaphragm and at a flow rate high enough to avoid saturating the air and low enough to avoid damage to the diaphragm until the diaphragm is substantially free of entrained water whereby to avoid boiling the entrained water and thereafter heating the diaphragm to cause the resin to bind the asbestos fibers together.

4,186,066
ELECTROLYSIS CATHODES WITH AG-TI INTERMETALLIC COATING

Robert C. Langley, Fairfield, N.J., assignor to Titanium Industries, Fairfield, N.J.

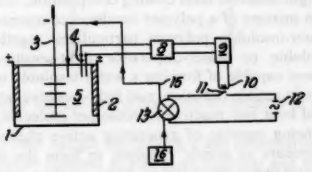
Filed Oct. 26, 1978, Ser. No. 953,741
Int. Cl.[2] C25B 1/16, 1/26, 11/10, 11/04
U.S. Cl. 204—98 12 Claims

1. A cathode for use in an electrolytic cell comprising a metal substrate selected from the group consisting of titanium and titanium alloys with a surface coating consisting essentially of at least one silver-titanium intermetallic compound.

4,186,067
ELECTROLYTIC RECOVERY OF SILVER FROM PHOTOGRAPHIC BLEACH-FIX BATHS

Colin C. Blake, Rochford, and Ivan C. Payne, Brentwood, both of England, assignors to Ciba-Geigy Aktiengesellschaft, Basel, Switzerland

Continuation-in-part of Ser. No. 586,836, Jun. 13, 1975, abandoned. This application Aug. 17, 1978, Ser. No. 934,302
Claims priority, application United Kingdom, Jun. 26, 1974, 28330/74
Int. Cl.[2] C25C 1/20, 7/00, 7/02
U.S. Cl. 204—109 7 Claims



1. A method of recovering metallic silver from bleach-fix baths which comprises passing an electric current through an electrolytic cell wherein the electrolyte is a bleach-fix solution containing silver ions and ferric ions, which solution has been brought by the addition of a reducing agent to a redox potential which indicates that substantially complete reduction of

the ferric ions to ferrous ions has occurred but at which no silver ions can be reduced to silver metal, and wherein reduced silver ions can deposit on the cathode as metallic silver, continuously monitoring the redox potential of the electrolyte and adding automatically a reducing agent to the electrolyte when the redox potential rises above a level which indicates the reappearance of ferric ions and stopping automatically the addition of the reducing agent when the redox potential drops below a level which indicates that substantially complete reduction of the ferric ions to ferrous ions has occurred but at which no silver ions can be reduced to silver metal as a consequence of the addition of the reducing agent to the electrolyte.

4,186,068

FOAMED RADIATION-CROSSLINKED HIGH DENSITY POLYETHYLENES

Louis C. Rubens, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 757,538, Jan. 7, 1977, abandoned. This application Dec. 14, 1977, Ser. No. 860,344

Int. Cl.[2] C08F *2/46, 8/18*

U.S. Cl. 204—159.2 **6 Claims**

1. A method which comprises the steps of

(a) intimately mixing together a mixture comprising high density polyethylene and thermosensitive chemical foaming agent which decomposes to form a gas at a decomposing temperature above the softening point temperature of the polyethylene to form a non-cellular foamable composition,

(b) shaping the resulting composition into a non-cellular foamable shape at a temperature below the decomposing temperature of the foaming agent,

(c) subjecting the resulting non-cellular foamable shape to high energy radiation to effect crosslinking of the polyethylene therein, and

(d) foaming the resulting radiation-crosslinked high density polyethylene-containing foamable shape by heating the same in at least one substantially oxygen-free medium selected from the group consisting of inert gasses and molten low-melting salts to a temperature above the decomposing temperature of the thermosensitive foaming agent in the composition of the foamable shape,

thereby making a foamed radiation-crosslinked high density polyethylene foam product having substantially closed and uniform fine-celled foam structure.

4,186,069

PHOTOPOLYMERIZABLE LATEX SYSTEMS

Thaddeus M. Muzyczko, and Daniel C. Thomas, both of Melrose Park, Ill., assignors to Richardson Graphics Company, Orland Park, Ill.

Filed Jan. 30, 1978, Ser. No. 873,383

Int. Cl.[2] C08F *2/50;* G03C *1/58;* C03C *1/68*

U.S. Cl. 430—175 **11 Claims**

1. A light-sensitive latex coating composition, comprising an emulsion mixture of a polymer emulsion component of water and water-insoluble polymer particulates together with a water-soluble or water-dispersible light-sensitive polymer component capable of forming a water-insoluble matrix upon exposure to actinic radiation, said light-sensitive polymer containing at least two reactive moieties per molecule, each such moiety being capable of generating active chemical species upon exposure to actinic radiation to form the matrix, said matrix containing cross-linked light-sensitive polymer with said polymer particulates dispersed therethrough, said emulsion mixture being a three-phase precursor emulsion of said water-insoluble polymer particulates in an aqueous suspension medium containing said light-sensitive polymer, and said emulsion polymer component is present at a weight percent ratio range of from about 1:10 to 10:1 relative to said light-sensitive component.

4,186,070

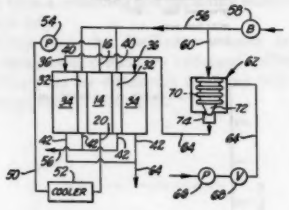
METHOD FOR TREATING A FLUID BY ELECTRON EMISSION

Joseph W. Harter, III, Los Angeles, and Stuart W. Beitzel, Santa Monica, both of Calif., assignors to 0-3 Company, Santa Ana, Calif.

Division of Ser. No. 837,022, Sep. 27, 1977. This application Nov. 30, 1978, Ser. No. 964,828

Int. Cl.[2] C01B *13/10*

U.S. Cl. 204—176 **4 Claims**



1. A process for operating an apparatus for fluid treatment by electron emission connected to a circuit means for causing electron emission in a space between a dielectric layer located on a surface of a first electrode and a second electrode as a fluid is passed through said space and as said first electrode is cooled by a cooling fluid passing through a first cooling jacket in contact with a surface of said first electrode remote from said space and as said second electrode is cooled by a cooling fluid passing through a second cooling jacket in contact with a surface of said second electrode remote from said space which comprises:

regulating the pressures of cooling fluids in both of said cooling jackets and of fluid within said space with respect to one another so as to vary the pressures exerted by said fluids on said electrodes so that the physical dimensions of said electrodes, said dielectric layer and said space are maintained so that the electrical characteristics of said apparatus remains substantially constant as said circuit means is operated and as fluids are moved through said cooling jackets and through said space.

4,186,071

PROCESS FOR PRODUCING OXYGEN GAS SENSOR ELEMENTS

Donald J. Romine; Donald C. Davis, both of Fostoria; Phillip R. Woodruff, Tiffin, all of Ohio; Ching T. Young, Troy, Mich.; James D. Bode, Royal Oak, Mich., and Tseng Y. Tien, Ann Arbor, Mich., assignors to Bendix Autolite Corporation, Fostoria, Ohio

Continuation-in-part of Ser. No. 885,423, Mar. 13, 1978, Pat. No. 4,136,000. This application Jan. 19, 1979, Ser. No. 4,781

Int. Cl.[2] C23G *1/02;* G01N *27/58*

U.S. Cl. 204—195 S **15 Claims**

1. A process for producing an activated oxygen gas sensor element having an increased voltage output under rich gas conditions, shortened switching response time and reduced internal resistance, wherein the sensor element comprises a solid electrolyte body having an inner conductive catalyst electrode on the inner surface and an outer conductive catalyst electrode on the outer surface thereof, comprising:

(a) contacting said inner conductive catalyst electrode with an acidic reactant selected from the group consisting of inorganic acids and acid salts;

(b) applying a direct current to the sensor element, with said outer conductive catalyst electrode as a cathode, while subjecting said outer conductive catalyst electrode to a neutral or inert atmosphere at an elevated temperature in excess of 500° C., the current density thereof being at least

5 milliamperes per square centimeter of the planar surface of said outer conductive catalyst electrode; and

(c) maintaining said outer electrode, after cessation of said current, at the elevated temperature for a period of time for recovery.

10. The activated oxygen gas sensor element produced according to the process of claim 1.

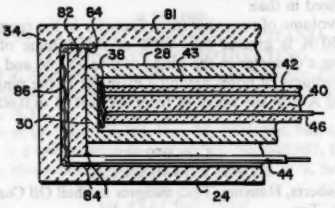
4,186,072
HOT GAS MEASURING DEVICE

Robert N. Blumenthal, 17470 Bard Ct., Brookfield, Wis. 53005, and Andreas T. Melville, 204 N. 86th St., Milwaukee, Wis. 53226

Continuation-in-part of Ser. No. 700,659, Jun. 28, 1976, Pat. No. 4,101,404. This application Jun. 12, 1978, Ser. No. 914,703

Int. Cl.[2] G01N *27/58*

U.S. Cl. 204—195 S 15 Claims



1. A gas measuring device for measuring a characteristic of high temperature gases comprising an electrolyte tube having an inside surface and an outside surface, said tube comprising a solid electrolyte material, mounting means for so mounting said tube that one of said surfaces is exposed to a hot corrosive gas whose characteristic is to be measured and the other said surface is exposed to a known reference gas, a first electrode, means for holding said first electrode in contact with said one surface, a second electrode, means for holding said second electrode in contact with said other surface, electrical conductors coupled to said electrodes, said mounting means including a bracket for fastening the device to the furnace wall and including an axially projecting sleeve concentric with the tube and attached to the bracket to provide support for said tube remote from said one end of said electrolyte tube for guiding said electrolyte tube for axial sliding movement within said sleeve and to afford axial shifting of said tube to maintain said tube in contact with said first electrode, and means for biasing said one surface of said one end of said electrolyte tube against said first electrode and comprising a hollow cap attached to said sleeve and a spring within said hollow cap bearing against the outer end of said electrolyte tube to press said one surface of said electrolyte tube against said first electrode to maintain good electrical contact therebetween, said first electrode comprising a chemically and thermodynamically stable electronic ceramic conductor means which is relatively inert to the electrolyte tube and said hot corrosive gas.

4,186,073
PACKAGE FOR SEWING MACHINE NEEDLES OR THE LIKE

Cesare Paganoni, Vaals, Netherlands, assignor to Nederlandse Naaldenfabriek Muva B.V., Vaals, Netherlands

Filed Oct. 27, 1978, Ser. No. 955,459

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1978, 7808823[U]

Int. Cl.[2] B65D *85/24*

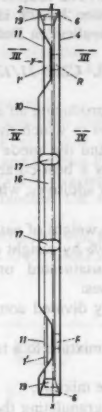
U.S. Cl. 206—380 11 Claims

1. A package for sewing machine needles or the like, comprising

a plate forming needle reception pockets in row-form adjacent to one another, said plate has a front side in which said needle reception pockets open along their length and a rear side, said plate being made out of a flexible material, said reception pockets corresponding in their lengths approximately to that of the needles,

said plate having end walls closing both ends of said reception pockets and being formed with catch projections projecting into the free spaces of said pockets, and

said plate being formed with at least one opening which communicates with said reception pockets and extends to the rear side of said plate.



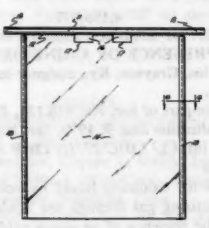
4,186,074
CATHODE FOR USE IN THE ELECTROLYTIC REFINING OF COPPER

Ian J. Perry, Townsville, Australia, assignor to Copper Refineries Pty. Limited, Queensland, Australia

Filed Feb. 9, 1979, Ser. No. 10,927

Int. Cl.[2] C25C *7/02*

U.S. Cl. 204—286 10 Claims



1. A cathode for use in the electrolytic refining of copper, comprising:

a stainless steel hanger bar having a flat undersurface with end portions adapted to rest upon supports and electrical contacts,

a flat stainless steel starter sheet welded by its upper edge to said undersurface between said end portions and so as to extend perpendicularly from said undersurface,

a copper cladding which envelopes said bar and at least the marginal upper portion of said sheet by which it is welded to said under surface, and

means to mask at least the upright side edges of said sheet.

4,186,075

ANODE FOR CATHODIC ELECTROCOATING

Fritz E. Kempter, Mannheim, and Klaus Boehlke, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 699,989, Jun. 25, 1976, abandoned. This application Jul. 28, 1978, Ser. No. 929,033

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1975, 2533822

Int. Cl.[2] C25B *11/12*; C25D *13/04*

U.S. Cl. 204—294 5 Claims

1. A process for producing an anode for the electrocoating of metallic substrates in which the substrate, which has been made the cathode, and the anode are dipped into an aqueous bath which contains a heat-curable cationic organic binder, pigments and further additives, wherein the anode consists of a mixture of

(A) 50 to 90% by weight of natural graphite and

(B) from 50 to 10% by weight of homo- or copolymers of ethylenically unsaturated organic compounds, which process comprises:

(1) mixing finely divided components (A) and (B) in an extruder,

(2) heating this mixture to a temperature of from 100° to 300° C.,

(3) extruding the mixture,

(4) cooling and granulating the extrudate, and

(5) compression-molding the granules to form the anode.

4,186,076

COMPOSITE DIAPHRAGMS

Oronzio de Nora; Luigi Giuffre, and Giovanni Modica, all of Milan, Italy, assignors to Oronzio deNora Impianti Elettrochimici S.p.A., Milan, Italy

Filed Feb. 22, 1979, Ser. No. 13,830

Claims priority, application Italy, Mar. 1, 1978, 20792 A/78

Int. Cl.[2] C25B *13/00, 13/08, 9/00*

U.S. Cl. 204—295 16 Claims

1. A porous, electrolyte permeable composite diaphragm comprising a chemically inert fibrous porous matrix or substrate impregnated with a copolymer of divinylbenzene and at least one member of the group consisting of 2-vinylpyridine and 4-vinylpyridine.

4,186,077

OXIDATION OF HYDROCARBON WAXES IN THE PRESENCE OF AMINE OXIDES

Donald D. Carlos, Grayson, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 918,131, Jun. 22, 1978. This application Jan. 9, 1979, Ser. No. 2,087

Int. Cl.[2] C07C *27/10*; C09F *7/02*

U.S. Cl. 208—3 13 Claims

1. A process for oxidizing liquid hydrocarbon comprising blowing an oxidizing gas through the liquid mass of said hydrocarbon in the presence of an amine oxide of the formula:

$$R_1R_2R_3N\rightarrow O$$

wherein R_1 is an alkyl radical having from 10 to 18 carbon atoms or an amide substituted group of the formula:

$$RC(=O)-N(H)-(CH_2)_n-CH_2-$$

wherein RCO is a long chain alkanoyl radical and n is a small whole number; and R_2 and R_3 are selected from the group consisting of alkyl radicals equivalent to R_1, lower alkyl radicals of 1 to 9 carbon atoms, and hydroxyalkyl groups.

4,186,078

CATALYST AND PROCESS FOR HYDROFINING PETROLEUM WAX

Takuji Itoh, Sayama; Satoshi Sakurada, Omiya; Shohei Okano, Tokorozawa; Takashi Obayashi, Kawagoe; Takeo Toyoizumi, Ohi, and Osami Iwata, Kawagoe, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 832,434, Sep. 12, 1977, Pat. No. 4,008,149. This application Apr. 20, 1978, Ser. No. 898,490

Int. Cl.[2] C10G *43/02*

U.S. Cl. 208—27 10 Claims

1. A process for hydrofining petroleum wax which comprises contacting the wax with hydrogen at hydrofining conditions in the presence of a catalyst comprising at least one metal hydrogenating component on a porous alumina/silica carrier containing from about 5 to 25 wt.% of silica and 0.2 to 5 wt.% of an alkali metal component and containing pores having diameters ranging from 0–600 A, said catalyst being further characterized in that:

(a) the volume of pores having a diameter in the range of 60 to 150 A is greater than 80% of the volume of pores having a diameter in the range of 0 to 150 A; and

(b) the volume of pores having a diameter in the range of 0 to 600 A is in the range of from about 0.45 to 0.60 ml/g.

4,186,079

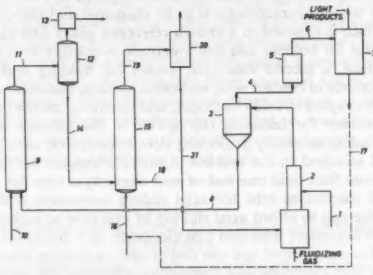
PYROLYSIS PROCESS

Scott C. Roberts, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 15, 1978, Ser. No. 970,068

Int. Cl.[2] C10G *9/32*

U.S. Cl. 208—127 3 Claims



1. A process comprising:

(a) continuously feeding a hydrocarbon-containing feedstock and a particulate heat carrier to a pyrolysis zone, the particulate heat carrier being at a temperature of 1500° F. to 2000° F. and being fluidized or entrained in the pyrolysis zone by an inert fluidizing or entraining gas, and contacting the feedstock and the heat carrier in the pyrolysis zone to produce an effluent product stream containing light hydrocarbons and heavy residual products, the total residence time of the feedstock and product stream in the pyrolysis zone being from 0.09 to 3.0 seconds, and concomitantly producing a cooler particulate heat carrier having carbonaceous deposits thereon; and continuously separating the effluent product stream from the heat carrier particles, quenching the product stream and recovering the light hydrocarbons in the product stream;

(b) continuously separating cooler particulate heat carrier having carbonaceous deposits thereon from the pyrolysis zone and passing said cooler particulate heat carrier to a heat exchange zone where the carbonaceous deposits are combusted with an oxygen-containing gas, supplemental fuel being added, if necessary, to heat the heat carrier to a temperature of from 1700° F. to 2300° F.;

(c) continuously removing the particulate heat carrier at 1700° F. to 2300° F. from combustion gases and passing said heat carrier to a synthesis gas generation zone;
(d) continuously feeding a carbonaceous feedstock and the particulate heat carrier to the synthesis gas generation zone at 1700° F. to 2300° F., the particulate heat carrier being fluidized in said synthesis gas generation zone, and contacting the heavy carbonaceous feedstock with steam and said fluidized heat carrier in said synthesis gas generation zone to produce synthesis gas and a particulate heat carrier at a temperature of 1500° F. to 2000° F., and recovering the synthesis gas; and
(e) continuously separating heat carrier at a temperature of from 1500° F. to 2000° F. from the synthesis gas generation zone and passing said particulate heat carrier to the pyrolysis zone of step (a) to provide the particulate heat carrier of step (a).

4,186,080

USE OF CATALYST COMPRISING TITANIA AND ZIRCONIA IN HYDROTREATING

Richard J. Mikovsky, Trenton, N.J., and Anthony J. Silvestri, Morrisville, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 750,754, Dec. 15, 1976, Pat. No. 4,128,505, which is a continuation-in-part of Ser. No. 642,957, Dec. 22, 1975, abandoned. This application Apr. 14, 1978, Ser. No. 896,266

Int. Cl.[2] C10G *23/02*

U.S. Cl. 208—143 **12 Claims**

1. A process for hydrotreating a petroleum fraction comprising contacting said petroleum fraction under hydrotreating conditions with a catalyst composition to remove nitrogen and sulfur and to saturate aromatics in said fraction, the catalyst base of which consists essentially of co-precipitated titania and zirconia, wherein the titania-zirconia co-precipitate contains from about 20% to about 80% by weight of titania and from about 80% to about 20% by weight of zirconia, the said base having associated therewith a mixture of (1) cobalt metal, cobalt oxide or cobalt sulfide and (2) molybdenum oxide or molybdenum sulfide.

8. A process for hydrotreating a petroleum fraction comprising contacting said petroleum fraction under hydrotreating conditions with a catalyst composition to remove nitrogen and sulfur and to saturate aromatics in said fraction, the catalyst base of which consists essentially of from about 10% to about 50% by weight of alumina, from about 15% to about 45% by weight of titania and from about 25% to about 65% by weight of zirconia, the said base having associated therewith constituents selected from the group consisting of (a) Group VIB metal oxides or metal sulfides, (b) Group VIII metals, metal oxides or metal sulfides and (c) mixtures thereof.

4,186,081

SILICA-PROMOTED HYDROFINING CATALYST AND PROCESS

Grant A. Mickelson, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 821,334, Aug. 3, 1977. This application Apr. 17, 1978, Ser. No. 896,733

Int. Cl.[2] C10G *23/06, 23/02*

U.S. Cl. 208—216 R **7 Claims**

1. A process for the hydrofining of a mineral oil feedstock containing organic sulfur and/or nitrogen compounds, which comprises contacting said feedstock plus added hydrogen, and under hydrofining conditions, with a catalyst comprising a sulfided composite of about 1–10 wt.% NiO and/or CoO, about 5–35 wt.% MoO_3, about 5–40 wt.% SiO_2, and the balance substantially Al_2O_3, said catalyst having been prepared by the steps of:

(A) ion exchanging a silica-alumina hydrogel containing about 50–90 wt.% SiO_2 with an ammoniacal solution of a cobalt and/or nickel compound to incorporate therein by ion exchange at least about 2 wt.% of Co and/or Ni;
(B) homogeneously admixing the undried solid product from step (A) with a boehmite alumina hydrogel, a molybdenum compound and sufficient water to provide an extrudable plastic mixture;
(C) extruding the plastic mixture to provide extrudates of desired size and shape; and
(D) drying and calcining the extrudates.

4,186,082

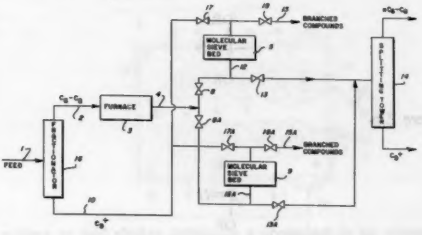
HYDROCARBON PROCESS FOR INCREASING THE CONCENTRATION OF NORMAL CIS OLEFINS

Chi-Hung Lin, Wheaton, Ill., and William F. Pansing, deceased, late of Munster, Ind. (by Evelyn Pansing Boyle, legal representative), assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 27, 1978, Ser. No. 881,556

Int. Cl.[2] C07C *7/13*; C10G *25/04*

U.S. Cl. 208—310 Z **8 Claims**



1. A process for increasing the concentration of normal cis olefins in a hydrocarbon composition, which comprises passing a hydrocarbon composition comprising normal cis olefins containing from about 4 to 20 carbon atoms and at least one member selected from the group consisting of branched olefins containing from about 4 to 20 carbon atoms, branched and normal paraffins containing from about 4 to 20 carbon atoms and aromatic hydrocarbons into a pretreated molecular sieve adsorption zone, withdrawing unadsorbed hydrocarbons and recovering adsorbed hydrocarbons having said increased concentration of normal cis isomers wherein said molecular sieve has been pretreated with water vapor for a period of 1 to 6 hours within the range from about 400° to about 500° F. to reach the stable water-zeolite equilibrium at said temperature range in the presence of water.

4,186,083

PROCESS FOR FROTH FLOTATION OF NON-SULFIDE MINERALS

Samuel S. Wang, Cheshire; Eugene L. Smith, Jr., and Ernie F. Huliganga, both of Milford, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 21, 1977, Ser. No. 863,034

Int. Cl.[2] B03D *1/02*

U.S. Cl. 209—166 **5 Claims**

1. A process for beneficiating non-sulfide minerals which comprises classifying the ore to provide particles of flotation size, slurrying the sized ore in aqueous medium, conditioning the slurry with an effective amount of a collector combination and floating the desired mineral values by froth flotation, said collector combination comprising from about 70 to about 99.9 weight percent of a fatty acid derived from a vegetable or animal oil and, correspondingly, from about 30 to about 0.1 weight percent of an anionic perfluorosulfonate compound of the general formula

$$CF_3—CF_2)_m(CH_2)_nY—X$$

wherein Y is $-SO_3^-$, X is hydrogen, alkali metal or ammonium ion, m is an integer of from about 4 to 8 and n is 0 or 1.

4,186,084

HYDROPHILIC FLUOROPOLYMERS

James C. Fang, Media, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 699,302, Jun. 24, 1976, which is a continuation-in-part of Ser. No. 579,099, May 20, 1975, abandoned. This application Apr. 11, 1978, Ser. No. 895,471

Int. Cl.² B01D *13/02*

U.S. Cl. 210—23 H **1 Claim**

1. In a process for separating diverse substances from each other by dialysis, osmosis or ionexchange, comprising exposing the surface of a membrane to said diverse substances in order to separate said diverse substances the improvement comprising using as the separating means a membrane of a fluoropolymer provided as a hydrophilic fluoropolymer containing nonterminal units represented by the structure

where Z is

where

R is an alkyl radical of 1–12 carbon atoms or a cycloalkyl radical of 3–12 carbon atoms,

the hydrophilic fluoropolymer having a phosphorus content of about 0.1–10% by weight, not more than about 1% by weight of the fluoropolymer dissolving in water at 20° C.

4,186,085

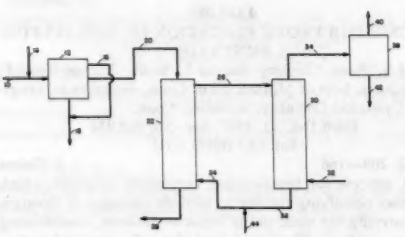
SUSPENSION OF POWDERED CARBONACEOUS ADSORBENT IN A HYDROCARBON SOLVENT AND ITS USE IN WASTE WATER TREATMENT

David W. Savage, Summit, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 3, 1978, Ser. No. 866,266

Int. Cl.² C02C *5/02*

U.S. Cl. 210—27 **26 Claims**



8. A process for removing suspended solids and organic contaminants from waste water which comprises:

(a) pretreating said waste water in a primary separation zone wherein a major portion of said suspended solids are removed therefrom;

(b) contacting said pretreated waste water with a slurry comprising a powdered carbonaceous adsorbent in a branched hydrocarbon solvent having a Miscibility Number of at least 25 and

(c) recovering water effluent that is reduced in suspended solids and said organic contaminants.

14. A process for removing dissolved organic contaminants from waste water which comprises:

(a) contacting said waste water with a slurry comprising a powdered carbonaceous adsorbent in a branched hydrocarbon solvent having a Miscibility Number of at least 25, thereby forming a water effluent that is reduced in organic contaminants and a slurry comprising said hydrocarbon solvent and powdered carbonaceous adsorbent having reduced adsorptive capacity;

(b) recovering said water effluent; and

(c) regenerating the slurry formed in (a), thereby forming a slurry containing powdered carbonaceous adsorbent having a greater capacity to adsorb organic contaminants than that possessed by the slurry formed in (a).

4,186,086

WEAK BASE ION EXCHANGE RESINS OF A POLYALKYLENEPOLYAMINE AND POLYEPOXIDE

Eldon L. Ward, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 26, 1978, Ser. No. 918,873

Int. Cl.² C02B *1/56*; C08G *59/02*

U.S. Cl. 210—37 R **14 Claims**

1. In a method for removing anions from an anion-containing liquid solution wherein the method comprises contacting the anion-containing liquid solution with a weak base ion exchange resin, the improvement comprising using as the weak base resin a normally solid reaction product of a polyepoxide and a polyamine of an aliphatic, alicyclic or aromatic hydrocarbon having three or more amino hydrogens in a molar ratio from about 0.1:1 to about 1.5:1 moles of polyepoxide to moles of polyamine.

4,186,087

METHOD AND APPARATUS FOR SEPARATING SUBSTANCES FROM LIQUIDS BY FLOTATION USING BUBBLES

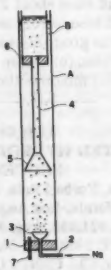
Yoshishige Kato, Tokyo, Japan, assignor to Director-General of Agency of Industrial Science and Technology, Tokyo, Japan

Filed Apr. 19, 1978, Ser. No. 897,790

Claims priority, application Japan, Apr. 22, 1977, 52-46571

Int. Cl.² B03D *1/24*

U.S. Cl. 210—44 **4 Claims**



1. In a method for removing substances from liquids in a column by flotation using bubbles which comprises passing downwardly through the column a liquid containing the substances to be removed, while bubbling a gas through the column countercurrently to the descending liquid, so as to bring the liquid into contact with the gas and thus adsorb the substance on the ascending bubbles, which are then collected and separated from the liquid in the upper part of the column, the improvement consisting in collecting and passing said ascend-

ing bubbles through at least one pre-established fluid path formed by a corresponding number of conduits having a diameter not greater than 4–5 cm and a length corresponding to about 8–24% of the total length of the column and placed within said column and extending from an intermediate portion of said column to the upper portion thereof, said conduits being independent of the ambient turbulently and downwardly flowing liquid, and gathering and collapsing the bubbles to retain the substance separated from the liquid.

4,186,088

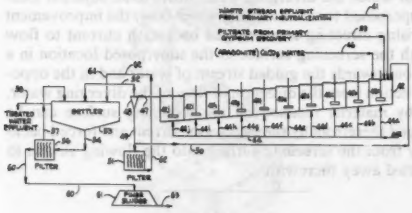
AQUEOUS FERROUS WASTE CONVERSION PROCESS

Steven J. Fitch, Baltimore; Philip R. Peeling, Finksburg, and David J. Heiser, Severna Park, all of Md., assignors to SCM Corporation, Cleveland, Ohio

Filed Feb. 13, 1978, Ser. No. 876,870

Int. Cl.² C02B *1/20*

U.S. Cl. 210—45 **13 Claims**



1. A process for the treatment of an aqueous ferrous sulfate waste stream, the sulfuric acid in said stream having been at least partially neutralized to make a gypsum product which gypsum product is separated therefrom, which comprises:

turbulently mixing said at least partially neutralized stream with a recycled flow of coarser sludge solids from a later stage of the process, impalpable calcium carbonate selected from the group consisting of limestone, aragonite, oyster shell or mixtures thereof in at least about 3% stoichiometric excess, and molecular oxygen gas in substantial excess of the stoichiometric proportions required for converting the ferrous iron present in said stream into ferric iron in a slurry reaction zone until virtually complete sludging at a temperature of at least about 10° C. of the iron content of said stream takes place;

classifying the resulting sludge into a coarser solids fraction of which at least about 10% by weight has an average particle size of greater than about 44 microns and an aqueous suspension of finer sludge solids;

returning between about 10% and 70% by weight of the coarser solids fraction as said recycled flow;

separating said finer sludge solids from said aqueous suspension thereof; and

disposing of the remainder of said aqueous suspension as effluent.

4,186,089

METHOD AND APPARATUS FOR DEWATERING OF SLUDGY SUBSTANCE

Hiroo Okada, Sagamihara, Japan, assignor to Kurita Water Industries Limited, Osaka, Japan

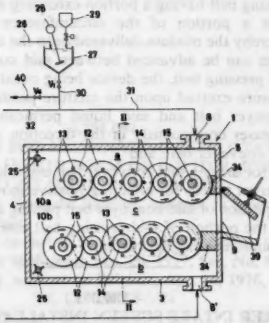
Filed May 15, 1978, Ser. No. 905,939

Claims priority, application Japan, May 16, 1977, 52/55272; May 16, 1977, 52/55273

Int. Cl.² C02B *1/20*

U.S. Cl. 210—49 **8 Claims**

7. A method for the dewatering of a sludgy substance by the use of an apparatus comprising a chamber provided with an outlet, two filtration trains opposed to each other across an intervening passage which communicates with said outlet, said filtration trains each consisting of a plurality of rotary filter elements which are each formed of a multiplicity of circular plates containing a plurality of filtrate discharging orifices arranged face to face in the axial direction at fixed intervals, said filtration trains intermeshing so that said circular plate of each rotary filter element enter the corresponding spaces between the circular plates of the adjacent rotary filter elements to a depth sufficient for the inserted edges of the circular plates to overlap at least the nearest ones of the filtrate discharging orifices in the circular plates of the adjacent rotary filter elements, said two trains being inclined to converge in the direction of said outlet and the rotary filter elements further from said outlet being rotated at the highest angular speed and those nearer the outlet being rotated at progressively lower angular speeds, said method including the steps of:



adding to said sludgy substance a coagulant in an amount ranging from 0.1 to 2.5% by weight based on the dry solids contained in said sludgy substance,

feeding said sludgy substance having the coagulant added thereto to the intervening passage between said two filtration trains for thereby increasing the compression force exerted on the sludgy substance in proportion as said sludgy substance proceeds to said outlet;

removing the liquid component of said sludgy substance to the exterior of said chamber via said filtrate discharging orifices, and

discharging out of said outlet the cake component of said sludgy substance.

4,186,090

METHOD AND DEVICE FOR REMOVING A LIQUID FROM A MIXTURE OF LIQUID AND SOLID SUBSTANCES

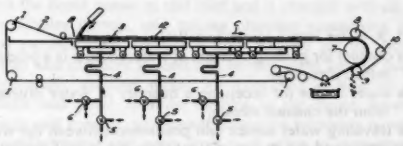
Jacob van Oosten, Maarsen, Netherlands, assignor to B.V. Machinefabriek v/h Pannevis & Zh., Utrecht, Netherlands

Filed Dec. 2, 1977, Ser. No. 856,787

Claims priority, application United Kingdom, Dec. 8, 1976, 51227/76

Int. Cl.² B01D *33/04*

U.S. Cl. 210—77 **13 Claims**



1. A method of removing liquid from a mixture of liquid and solid, comprising the steps of:

delivering the mixture onto an upper run of a liquid permeable conveyer belt, said upper run of belt conveying the mixture along a substantially straight path;

draining liquid from the mixture through the upper run of said conveyer belt in a first portion of the path;

exerting pressure which increases continuously in the direction of motion of the belt in a later curved portion of the path by means of a liquid permeable pressing belt pressing on the mixture to express additional liquid from the mixture; and

causing shear of the solid by effecting relative displacement of particles of the solids in the mixture in said later curved portion of the path.

6. A device for carrying out the method according to claim 1, comprising:

a liquid permeable conveyer belt having an upper run onto which a mixture of liquid and solid can be delivered and through which liquid can drain;

a drum around which said conveyer belt passes;

a pressing belt having a portion extending along and spaced from a portion of the circumference of said drum, whereby the mixture delivered onto the upper run of said drum can be advanced between said conveyer belt and said pressing belt, the device being constructed such that pressure exerted upon the mixture passing between said conveyer belt and said liquid permeable pressing belt increases continuously in the direction of movement of said conveyer belt; and

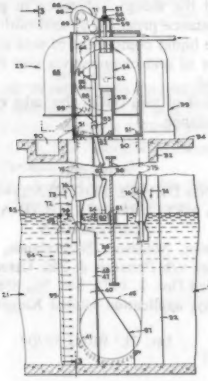
means for driving said conveyer belt and said pressing belt at different speeds for effecting relative movement between the portion of said conveyer belt passing around the drum and the portion of said pressing belt extending along the circumference of said drum.

4,186,091

WATER INTAKE SCREEN INSTALLATION AND METHOD OF STRAINING WATER

William M. Sutton, North Wales, Pa., assignor to FMC Corporation, San Jose, Calif.

Filed Jul. 27, 1978, Ser. No. 928,769
Int. Cl.[2] B01D *33/22, 35/22*
U.S. Cl. 210—77 **16 Claims**



1. A water intake screen installation comprising

a channel for guiding a stream of water to flow in a predetermined direction,

a water intake for receiving a quantity of water diverging from the channel stream,

a traveling water screen unit positioned between the water intake and the stream of water flowing in the channel for straining the diverqing water,

said screen unit having an endless belt strainer in the form of a vertical loop with an upwardly extending screening surface that also extends laterally in a direction parallel to the predetermined direction of stream flow,

said screen unit having a drive for revolving the endless belt strainer to elevate a portion of the screening surface relative to the channel, and

means for directing a backwash current through the screening surface towards the stream of water flowing in the channel at an elevation above the diverging water and below the stream surface, whereby material retained on the screening surface can be dislodged by the backwash current and forced backwardly from the screening surface into the stream of water flowing in the channel to be carried away therewith,

said backwash current directing means being supported by a floating carriage.

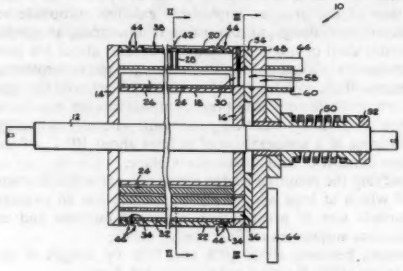
15. In a method of straining water from a stream including the steps of guiding a stream of water to flow in a predetermined direction, drawing a quantity of water to diverge laterally from the predetermined direction of flow of the stream of water, straining the diverging quantity of water with a screening surface of an endless belt strainer, and vertically shifting the endless belt strainer screening surface from a location through which the diverging water flows to an adjacent location superposed to the diverging water flow, the improvement comprising directing a submerged backwash current to flow through the screening surface at the superposed location in a direction towards the guided stream of water and in the opposite direction from the direction of flow of the diverging water, whereby material retained on the screening surface can be dislodged therefrom by the backwash current and forced backwardly from the screening surface into the flowing stream to be carried away therewith.

4,186,092

VACUUM BELT FILTERS

Theodor M. Stielau, Sandton, South Africa, assignor to Delkor Technik (Proprietary) Limited, Randburg, South Africa

Filed Aug. 14, 1978, Ser. No. 933,474
Int. Cl.[2] B01D *33/04, 33/36*
U.S. Cl. 210—77 **19 Claims**



1. A horizontal vacuum belt filter which includes

an endless filter cloth on which a residue filter cake is, in use, formed:

a filter head roller; and

a rotatable discharge roller located some distance forward of the head roller, a portion of the filter cloth passing over a segment of the cylindrical surface of the discharge roller and being in engagement therewith, and the discharge roller having a channelling means for channelling a discharge liquid through the said portion of the filter cloth that is in engagement with the discharge roller, in a reverse direction through the cloth, thereby to separate the residue cake from the cloth.

15. A method of discharging a residue cake from a filter cloth of a horizontal vacuum belt filter, which includes

passing a portion of the filter cloth over a segment of the cylindrical surface of a rotatable discharge roller; and

causing a discharge liquid to flow in a reverse direction through the said portion of the filter cloth in engagement

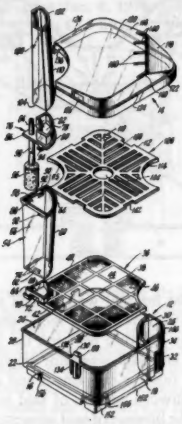
with the segment of the roller, via the roller, thereby to separate the residue cake from the filter cloth.

4,186,093

BOTTOM AQUARIUM FILTER

Allan H. Willinger, New York, N.Y., assignor to Willinger Bros., Inc., New York, N.Y.

Filed Dec. 19, 1977, Ser. No. 861,543
Int. Cl.[2] E04H *3/20*
U.S. Cl. 210—169 **20 Claims**



1. An aquarium filter for an aquarium tank, said filter comprising in combination:

a container having an inlet compartment in a fluid flow relationship with the tank, a filtration compartment in a fluid flow relationship with said inlet compartment, said filtration compartment being structured to contain a mass of filtering material, and a decontaminated water compartment in a fluid flow relationship with said filtration compartment;

restraining means positioned in said filtration compartment for confining the filtering material to a filtering section of said filtration compartment and for providing in another section of said filtration compartment a flow chamber, said flow chamber connecting said inlet compartment with said filtering section in a fluid flow relationship, said restraining means including a restraining plate, said restraining plate being perforated to permit contaminated water to flow therethrough, said restraining plate maintaining said flow chamber substantially free of the filtering material;

said container having at least a bottom wall, front and rear walls, and a partition wall, said partition wall extending upwardly from said bottom wall and merging into said front wall to provide said inlet compartment, and openings in said front wall through which the contaminated water can flow into said inlet compartment;

upper edges of said front, rear, and partition walls all being disposed in a common plane, said restraining plate being supported on said upper edges in said common plane, and a cover extending above said upper edges, said cover including rim means disposed on said restraining plate for maintaining said restraining plate in position on said upper edges;

said cover further including wall means for directing the contaminated water from said inlet compartment laterally across said flow chamber, said wall means including a substantially inverted V-shaped top wall to provide two inclined sections, one inclined section of said top wall being substantially positioned over said inlet compartment, and the other inclined section of said top wall being substantially positioned above said restraining plate defining said flow chamber;

air stream supply means disposed in said container for directing air into said decontaminated water compartment, and outlet means coupled to said decontaminated water compartment for an egress of decontaminated water and air out of said decontaminated water compartment;

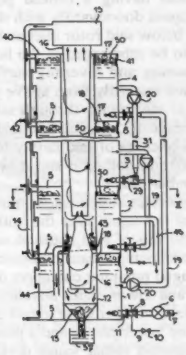
whereby contaminated water from the tank enters through said front wall openings into said inlet compartment and passes therefrom into said flow chamber, and then passes through said perforated restraining plate into said filtering section where said contaminated water is substantially decontaminated by the filtering material before passing into said decontaminated water compartment and being egressed through said outlet means into the tank.

4,186,094

APPARATUS FOR ELIMINATING BY FLOTATION IMPURITIES IN THE FORM OF SOLID PARTICLES CONTAINED IN A LIQUID

Enar V. Heilberg, Brussels, Belgium, assignor to Swemac S.A., Brussels, Belgium

Continuation-in-part of Ser. No. 784,937, Apr. 5, 1977, abandoned. This application Sep. 20, 1977, Ser. No. 834,883
Claims priority, application Belgium, Apr. 12, 1976, 166085
Int. Cl.[2] B03D *1/24*
U.S. Cl. 210—221 P **14 Claims**



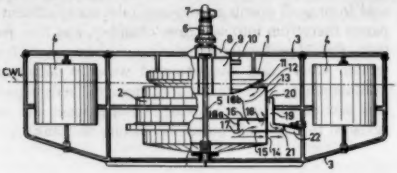
1. Apparatus for elimination by flotation of solid particle impurities contained in a liquid, which comprises at least one flotation cell having an inlet for the liquid to be treated and separate outlets for foam containing impurities and for cleaned liquid, and, upstream of said inlet, a mixing chamber through which the liquid passes to said inlet and is charged with air to form bubbles therein, said mixing chamber comprising opposed parallel walls forming a flow passage for the liquid through said chamber at least one of said walls having pores therethrough, aeration means for providing a flow of air through said pores to form bubbles in the liquid flowing through said passage, adjustment means for relatively moving said walls toward and away from each other to respectively decrease and increase the width of the passage between them and hence the velocity of the flow of liquid through said passage, thereby inversely changing the size of bubbles formed, and inlet means for providing a flow of the liquid into the upstream end of said passage.

4,186,095

OIL COLLECTING APPARATUS

Gösta Walin, L. Montorsgatan 3, Västra Frölunda, Sweden (S-421 68)

Filed Apr. 20, 1978, Ser. No. 898,079
Claims priority, application Sweden, Apr. 27, 1977, 7704814
Int. Cl.[2] E02B 15/04
U.S. Cl. 210—242 S 6 Claims



1. Apparatus for separating and collecting floating pollution from a surface-contaminated liquid comprising:

a buoyant framework including a plurality of floats;

a hollow rotor having a generally upstanding sidewall, an open upper end defining an inlet to the interior of said rotor, outlets in a lower portion of said sidewall, and a closed bottom supporting said rotor in said framework for rotation about a substantially vertical axis with said inlet submerged in the liquid near the surface thereof;

drive means carried by said framework for rotating said rotor to establish a vortex of liquid in said rotor interior to draw contaminated liquid thereinto through said inlet and to expel liquid therefrom through said outlets;

a stator carried by said framework directly above said rotor, said stator being substantially symmetrical about said vertical axis and having a central pollution-collecting cavity which opens downwardly with the opening of said cavity located below said rotor inlet and within said rotor interior so as to be submerged in the liquid, and a lower pollution-contacting and diverting surface which slopes downwardly and inwardly from above said rotor inlet at the periphery of said stator, through said rotor inlet and through the surface of the liquid into said rotor interior, to the submerged opening of said cavity to slow the movement of the floating pollution and divert it toward said collecting chamber; and

vaned inner pump means in said rotor interior for recirculating a portion of the liquid near the bottom of said rotor back toward the top of said rotor to support the liquid vortex, said inner pump means comprising a plurality of annularly arranged pumping chambers defined by spaced annular upper and lower plates attached to said sidewall above said outlets, an inner plate joined to the inner edges of said upper and lower plates, and a plurality of upstanding annularly spaced radial vanes dividing the annular space between said sidewall and said plates into chambers having an outlet in said upper plate adjacent to said sidewall and an inlet in said lower plate adjacent to said inner plate.

4,186,096

SHIFTABLE BOTTOM WALL FOR SEPARATOR BOWL AND BLADE CONSTRUCTION THEREFOR

Larry D. Areaux, Texas Township, Kalamazoo County, and Frank C. Halisek, Portage, both of Mich., assignors to Reclamet, Inc., Kalamazoo, Mich.

Filed Oct. 30, 1978, Ser. No. 955,578
Int. Cl.[2] B01D 33/10
U.S. Cl. 210—377 7 Claims

1. A centrifuge for continuously separating a lubricating liquid from lubrication-impregnated metal shavings or the like, comprising:

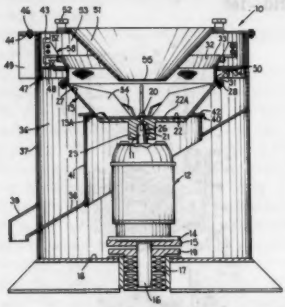
a motor having a rotatable drive shaft;

substantially bell-shaped centrifugal separator bowl means having a shaving dispensing edge and openings for the discharge of liquid therethrough;

power transmission means for transmitting rotatable output from said drive shaft to said separator bowl means;

a plurality of angularly spaced blade means in the bottom of said separator bowl means; and

support means for supporting said blade means for movement relative to said separator bowl means;



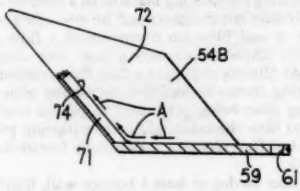
whereby wear on the internal wall of said separator bowl caused by the movement of said metal shavings along a path located at the juncture between the leading side of said blade means and said separator bowl will be minimized due to said relative movement and a relocating of said path on an unworn section of said internal wall to thereby enhance the lifetime of said separator bowl means.

4,186,097

SHIFTABLE BOTTOM WALL FOR SEPARATOR BOWL AND WEAR SHOE THEREFOR

Robert H. Dudley, and Frank C. Halisek, both of Portage, Mich., assignors to Reclamet, Inc., Kalamazoo, Mich.

Filed Oct. 30, 1978, Ser. No. 955,579
Int. Cl.[2] B01D 33/10
U.S. Cl. 210—377 3 Claims



1. A centrifuge for continuously separating a lubricating liquid from lubrication-impregnated metal shavings or the like, comprising:

a motor having a rotatable drive shaft;

substantially bell-shaped centrifugal separator bowl means having a shaving dispensing edge and openings for the discharge of liquid therethrough;

power transmission means for transmitting rotatable output from said drive shaft to said separator bowl means; and

wear resistant liner means in the bottom of said separator bowl means and having a plurality of angularly spaced blade means thereon, said liner means including a partial wall means adjacent the leading side of said blade means, the leading edge of which is angularly spaced from the trailing side of the next of said blade means, for guiding the movement of said metal shavings thereover adjacent

the radially outer edge thereof to protect said separator bowl means from wear; and

support means for supporting said wear resistant liner means for rotatable movement relative to said separator bowl means.

4,186,098

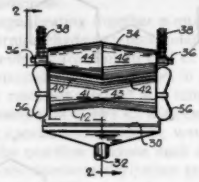
SLUDGE DEWATERING APPARATUS

William E. Morris, 1831 N. Douglass, Appleton, Wis. 54911

Division of Ser. No. 787,338, Apr. 14, 1977, Pat. No. 4,115,275. This application Jun. 8, 1978, Ser. No. 913,878

Int. Cl.[2] B01D *33/04*

U.S. Cl. 210—386 **28 Claims**



1. In an apparatus for dewatering sludge, a dewatering section having an endless filter means sloped inwardly from the lateral edges to form a central trough along the top run on which the sludge is carried through the dewatering section for drainage of water through the filter means, pressure rollers extending crosswise of and longitudinally spaced above the top run of the filter means and operative to apply pressure onto the sludge during passage through the dewatering section, means for feeding the sludge onto the head end portion of the endless filter means, a plurality of crosswise extending, longitudinally spaced support rollers which taper inwardly from the lateral edges towards the center to support the top run of the endless filter means during passage through the dewatering section, the feed pressure rollers tapering outwardly from a base at the center towards the lateral edges in a manner opposite to that of the support rollers to enable the pressure rollers to nest within the support rollers with a spaced relation at the nip formed therebetween, and means for driving the endless filter means for linear movement in one direction.

4,186,099

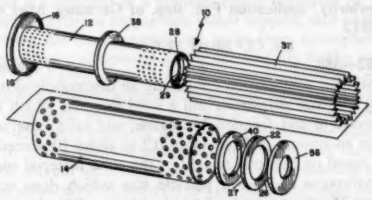
FILTER ASSEMBLY WITH PAPER CARTRIDGE

Arthur O. Henschel, Jr., National City, and Lurin K. McCracken, Chula Vista, both of Calif., assignors to All Services Enterprises, Inc., National City, Calif.

Continuation of Ser. No. 767,842, Feb. 11, 1977, abandoned. This application Jun. 19, 1978, Ser. No. 916,481

Int. Cl.[2] B01D *27/06*

U.S. Cl. 210—457 **2 Claims**



1. In a filter assembly including a cylindrical housing having an inlet, a co-axially disposed perforated outlet and support tube non-detachably fixed to and extending substantially the length of the housing, and a cartridge retainer nut threadably mounted on the end of said outlet and support tube, the improvement comprising:

a refillable filter cartridge consisting of an inner perforated tubular member and an outer perforated tubular member,

a first end cap non-detachably fixed on one end of said inner tubular member having an inner through bore slidably fixed on said support tube for supporting said inner perforated tubular member on said support tube, and an annular flange fitting over the end of said outer perforated tubular member for supporting said outer perforated tubular member in spaced relationship to said inner perforated tubular member,

an annular support member supporting the outer end of the inner perforated tubular member on said support tube,

a removable pleated tubular filter element disposed between said inner and said outer perforated tubular members,

a second cap member detachably engaging the other end of said inner and said outer perforated tubular members,

an annular resilient seal disposed between each end of said tubular filter element and each of said cap members, and

said retainer nut biasing said second cap member axially along said support tube for biasing said resilient seals into sealing engagement with the ends of said tubular filter element and said cap members, and biasing said second end cap into tight engagement with said inner and outer tubular members and thereby detachably retaining said members together on said support tube.

4,186,100

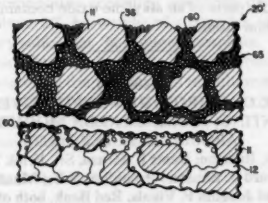
INERTIAL FILTER OF THE POROUS METAL TYPE

Lambert H. Mott, Farmington Industrial Park, Farmington, Conn. 06032

Continuation-in-part of Ser. No. 749,874, Dec. 13, 1976, Pat. No. 4,088,576. This application Apr. 17, 1978, Ser. No. 896,222

Int. Cl.[2] B01D *39/20*

U.S. Cl. 210—496 **9 Claims**



1. An inertial type filter element comprising a porous wall composed of sintered metal particles in the size range of 0.5 to 44 microns and having a subsurface section not exceeding about 0.015 inches in thickness adjacent its upstream surface having a smaller pore size formed by finer metal particles in the size range of 0.02 to 0.5 microns which are deposited and sintered therein.

4,186,101

FILTER

Erich K. Reinhardt, Bietigheim-Bissingen, Fed. Rep. of Germany, assignor to Schumacher'sche Fabrik GmbH & Co. KG, Bissingen, Fed. Rep. of Germany

Filed Jan. 13, 1978, Ser. No. 869,298

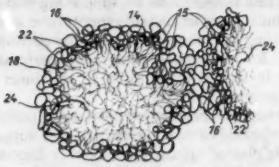
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1977, 2702210

Int. Cl.[2] B01D *39/04, 39/06*

U.S. Cl. 210—497 R **30 Claims**

1. A rigid filter for filtering a fluid comprising a matrix, a plurality of fibre flakes composed of fibres distributed as fibre cells throughout said matrix, said fibre flakes being compressed preferably in a direction perpendicular to that in which said fluid will flow, said fibre flakes being anchored by fibres located at the periphery of said flakes to said matrix.

17. A method of manufacturing a filter comprising a plurality of fibre flakes distributed as fibre cells throughout a matrix, which method comprises the steps: mixing fibre flakes and a



binder; putting the resulting mixture in a mould; compressing the mixture such that the fibre flakes are compressed; and solidifying the binder by a dry method to form a matrix.

4,186,102

LUBRICATING OIL COMPOSITION

Robert E. Malec, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 467,051, May 6, 1974, Pat. No. 4,117,011. This application Jul. 10, 1978, Ser. No. 923,070

Int. Cl.[2] C10M *3/26;* **C07C** *87/28*

U.S. Cl. 252—51.5 R **17 Claims**

1. A lubricating oil composition comprising a major amount of lubricating oil and a dispersant amount of a composition made by the process comprising reacting (a) one mole part of an aliphatic hydrocarbon-substituted phenol wherein said aliphatic hydrocarbon substituent has an average molecular weight of from about 650 to 5000, (b) from about 1 to 10 mole parts of a C_{1-4} aldehyde, (c) from about 0.1 to 10 mole parts of an amine containing at least one $HN<$ group capable of entering into a Mannich condensation reaction and (d) from about 0.1 to 50 mole parts of an alkylene oxide containing from 2 to about 6 carbon atoms.

4,186,103

USE OF SPIROPYRAN DERIVATIVES IN AUGMENTING, ENHANCING OR MODIFYING THE AROMA OF DETERGENTS

John B. Hall, Rumson; Denis E. Hruza, Sr., Brick Town, both of N.J.; Edward J. Shuster, Brooklyn, N.Y.; Manfred H. Vock, Locust, and Joaquin F. Vinals, Red Bank, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

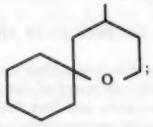
Continuation-in-part of Ser. No. 765,629, Feb. 4, 1977, which is a division of Ser. No. 701,249, Jun. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 547,057, Feb. 4, 1975, abandoned. This application Apr. 6, 1979, Ser. No. 27,949

Int. Cl.[2] C11D *3/50*

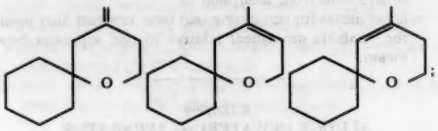
U.S. Cl. 252—174.11 **1 Claim**

1. A process for preparing a solid or liquid detergent comprising the step of intimately admixing with a solid or liquid detergent base from 100 parts per million up to 3.0% by weight of said detergent of a spiropyran composition comprising at least one substance selected from the group consisting of:

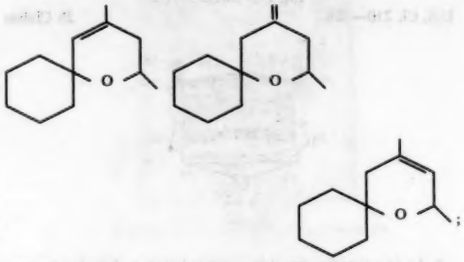
(i) a spiropyran compound having the structure:



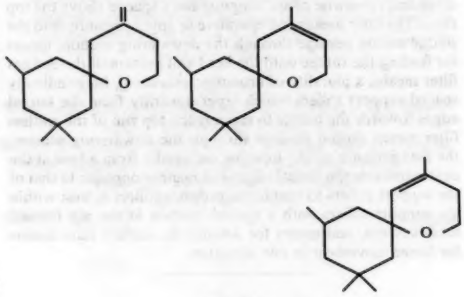
(ii) a mixture of spiropyrans having the structures:



(iii) a mixture of spiropyrans having the structures:



and (iv) a mixture of spiropyran compounds having the structures:



4,186,104

ANTIFOAM COMPOSITIONS

Ewald Pirson, Burghausen, and Jakob Schmidlkofer, Mehring-Od, both of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,006

Claims priority, application Fed. Rep. of Germany, May 6, 1977, 2720512

Int. Cl.[2] B01D *19/04*

U.S. Cl. 252—358 **5 Claims**

1. An antifoam composition containing an organopolysiloxane having antifoam properties and a solid material which is finely dispersed in said organopolysiloxane, said solid material is present in an amount of from about 0.2 to about 10 percent by weight based on the total weight of the solid material and organopolysiloxane and has a particle size which does not exceed about 25 microns, said solid material is a solid at least at the temperature at which the antifoam composition is used and is obtained from the reaction of an isocyanate and at least one organic compound having a molecular weight of from about 62 to about 10,000 and at least one hydrogen atom capable of reacting with the N=C=O group.

4,186,105
ANTIOXIDANTS

Peter C. Bonsall; James W. Morrison; Eric S. Nicholson; George B. Smith, and Kenneth G. Townley, all of Blackley, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jul. 21, 1977, Ser. No. 817,673

Claims priority, application United Kingdom, Jul. 21, 1976, 30360/76

Int. Cl.[2] C09K *15/32*

U.S. Cl. 252—400 R **12 Claims**

1. A process for the manufacture of diphenylamine-formaldehyde reaction products containing N,N,N′,N′-tetraphenyldiaminomethane as the principal product of reaction, which reaction comprises:

(1) In a first stage, heating together a mixture of diphenylamine and formaldehyde in a molecular ratio of from 3:1 to 1:1.5 at a temperature of up to 110° C. until evolution of water is substantially complete, then in a second stage,

(2) heating the resultant mixture at a temperature of from 120° C. to a maximum of 140° C. with exclusion of oxygen or oxidising agents, and removing water and formaldehyde from the reaction mixture until the proportion of bis,(N,N-diphenylaminomethyl)ether present in the mixture falls to below 10% by weight.

4,186,106
PROCESS FOR IMPROVING THE ACTIVITY OF USED SUPPORTED SILVER CATALYSTS

Siegfried Rebsdat, Burg; Sigmund Mayer, Burgkirchen; Josef Alfranseder, Marktl, and Josef Riedl, Burgkirchen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 5, 1978, Ser. No. 939,329

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1977, 2740480

Int. Cl.[2] B01J *23/96, 23/50;* **C07D** *301/10, 303/04*

U.S. Cl. 252—414 **12 Claims**

1. Process to improve the activity of supported silver catalysts which have been used for the direct oxidation of ethylene to ethylene oxide with molecular oxygen or air by applying to the catalyst from 1 to 1,000 parts, per 1 million part of catalyst, of cesium, rubidium or a mixture thereof, which comprises washing the catalyst with an inert organic liquid prior to the application of cesium rubidium or mixture thereof.

4,186,107
SOLID CATALYST COMPONENT FOR OLEFIN POLYMERIZATION

Kalus P. Wagner, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Apr. 14, 1978, Ser. No. 896,279

Int. Cl.[2] C08F *4/02, 4/64*

U.S. Cl. 252—429 B **10 Claims**

1. A process for the preparation of a solid catalyst component for use in the polymerization of 1-olefins, which component is composed of a titanium halide deposited on an essentially anhydrous magnesium halide support, said process comprising the steps, carried out in an inert atmosphere, of (1) dissolving a compound having the formula R_2Mg, where R is a C_2–C_{20} alkyl group, in a hydrocarbon solvent or a mixture of the hydrocarbon solvent with an electron donor, (2) dissolving a compound having the formula R'_nAlX_{3-n}, wherein R′ is a C_1–C_{20} alkyl group, X is a chlorine or bromine atom and n is 1 or 2, in a hydrocarbon solvent or a mixture of the hydrocarbon solvent with an electron donor, (3) contacting the resulting solutions from steps (1) and (2) with each other at a temperature of from about −65° C. to about 30° C. for a period of from about 0.5 to about 5 hours, thereby forming a suspension in the solvent of magnesium halide particles ranging from about 0.05 to about 80 microns in size, (4) isolating said particles from said suspension, (5) successively washing said particles with a hydrocarbon solvent until the particles are substantially free of halide and residual aluminum compounds, (6) contacting said particles with an electron donor before and/or after said particles are successively washed with hydrocarbon solvent, with the proviso that step (6) may be omitted when an electron donor is present in step (1) and/or step (2), (7) washing the donor-treated particles with a hydrocarbon solvent, (8) contacting the washed particles with an alkyl ester of an aromatic acid, wherein the ester contains a total of 8 to 24 carbon atoms, and with a titanium halide, thereby effecting deposition of said titanium halide on the magnesium halide particles, (9) contacting the resulting particles with an electron donor and (10) washing the donor-treated particles with a hydrocarbon solvent, said hydrocarbon solvent being selected from the group consisting of C_5–C_{12} aliphatic hydrocarbons, C_5–C_{12} monocyclic cycloaliphatic hydrocarbons, C_6–C_{12} monocyclic aromatic hydrocarbons and mixtures thereof, and said electron donor being selected from the group consisting of C_4–C_{24} aliphatic ethers, C_3–C_4 cyclic ethers, C_7–C_{15} aromatic ethers, C_4–C_{24} alkyl esters of fatty acids, C_8–C_{24} alkyl esters of aromatic acids, C_1–C_{12} aliphatic amines, C_4–C_6 cyclic amines, C_6–C_{10} aromatic amines, C_1–C_{18} aliphatic alcohols, C_7–C_{15} aromatic alcohols, C_6–C_{10} phenols, C_6–C_{18} aliphatic or aromatic phosphines and C_6–C_{12} aliphatic sulfides.

4,186,108
LIQUID COMPOSITIONS CONTAINING TRIARYLSULFONIUM COMPLEX SALTS AND OXYETHYLENE MATERIAL

Robert C. Carlson, Hudson, Wis., and Albert H. Stoskopf, Cottage Grove, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 8, 1978, Ser. No. 876,115

Int. Cl.[2] B01J *31/02;* **G03C** *1/72*

U.S. Cl. 252—426 **5 Claims**

1. A liquid composition consisting essentially of:

(a) at least about 5% by weight of a complex salt selected from triarylsulfonium hexafluorophosphate, triarylsulfonium hexafluoroantimonate, triarylsulfonium hexafluoroarsenate and triarylsulfonium tetrafluoroborate; and

(b) at least about 15% by weight of liquid neutral oxyethylene-containing material selected from:

(i) compounds having the formula

$$R[(OC_2H_4)_n(OC_3H_6)_mOH]_p$$

where R is a polyvalent neutral organic radical having a valence of p, n + m is in the range of 1 to about 25, p is in the range of 2 to 6, wherein the oxyethylene units in such compounds constitute at least about 15% by weight of such compounds; and wherein the number of carbon atoms in R divided by the product of n and p is less than three; and

(ii) compounds having the formula:

$$R^1(OC_2H_4)_n(OC_3H_6)_mOH$$

where R^1 is monovalent neutral organic radical, where n + m is in the range of 1 to about 25, wherein the oxyethylene units in such compounds constitute at least about 50% by weight of such compounds; and

(iii) compounds of the formula:

$$H(OC_2H_4)_n(OC_3H_6)_mOH$$

where n + m is in the range of 2 to about 25, wherein the oxyethylene units in such compounds constitute at least about 15% by weight of such compounds;

wherein said salt is dissolved in said oxyethylene-containing material.

4,186,109

CATALYST FOR SELECTIVELY REDUCING NITROGEN OXIDES FROM OXYGEN-CONTAINING EXHAUST GASES

Masumi Atsukawa; Yoshihiko Nishimoto; Naruo Yokoyama, all of Hiroshima, and Toshikuni Sera, Saiki, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1977, Ser. No. 836,961

Claims priority, application Japan, Sep. 30, 1976, 51/117424; Feb. 18, 1977, 52/16874

Int. Cl.[2] B01J *27/02*

U.S. Cl. 252—440 **5 Claims**

1. A catalyst for the selective catalytic reduction of nitrogen oxides using ammonia as a reducing agent, the catalyst comprising a carrier in a given physical form made from a slurry of crystallized calcium silicate prepared by mixing silicic acid and lime and heating the mixture under pressure wherein said carrier is pretreated with sulfuric acid or a sulfate to neutralize the free CaO and a catalytically active constituent selected from the group consisting of sulfates of iron, copper, vanadium or combinations thereof.

4,186,110

NOBLE METAL-REFRACTORY METAL ALLOYS AS CATALYSTS AND METHOD FOR MAKING

Vinod M. Jalan, Manchester, and Douglas A. Landsman, West Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 3, 1978, Ser. No. 922,004

Int. Cl.[2] B01J *21/00, 21/12, 21/18, 23/40*

U.S. Cl. 252—447 **7 Claims**

1. A method for making carbon supported noble metal-refractory metal alloy catalysts comprising:

(a) providing a supported unalloyed noble metal catalyst in the form of a carbon support material having finely-divided noble metal particles uniformly dispersed on its surface; and

(b) reacting the carbon supported noble metal catalyst particles with a refractory metal oxide by intimately contacting the carbon supported noble metal particles with finely divided particles of said metal oxide and heating to a sufficiently high temperature in a locally reducing environment to thermocatalytically reduce the oxide and at the same time form an alloy between the noble metal and the refractory metal, wherein said carbon support material provides the locally reducing environment and the support for said alloy.

4,186,111

STABILIZED ALUMINOSILICATE HYDROCRACKING CATALYST

Jarold A. Meyer, Concord, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 769,625, Feb. 16, 1977, Pat. No. 4,137,146, which is a continuation-in-part of Ser. No. 586,674, Jun. 13, 1975, abandoned. This application Aug. 21, 1978, Ser. No. 935,415

Int. Cl.[2] B01J *37/02, 29/06*

U.S. Cl. 252—453 **3 Claims**

1. A composition suitable for use as a catalyst precursor which comprises:

(1) an amorphous silica-alumina component having an alumina content, calculated on the basis of the respective oxides in the anhydrous form, in the range from about 40 to 95 weight percent, said silica-alumina having been simultaneously cogelled;

(2) a Group VIII noble metal organic-metal compound component having a noble metal content, calculated as the metal and based upon said silica-alumina content, in the range from about 0.1 to 3 weight percent, said organic-metal noble metal compound component, a precipitate, having been produced by the interaction by complex compound formation or metathesis in aqueous medium of a water-soluble compound of at least one of said noble metals with at least one organic gravimetric reagent therefor, said reagent and compound exhibiting a solubility product, Ksp, of less than about 10^{-3}; and

(3) a residue comprising water, water-soluble inorganic salts resulting from said cogelation and said interaction, and a minor amount of said reagent.

4,186,112

CATALYST FOR REDUCING CARBON MONOXIDE WITH HYDROGEN

Wilhelm Vogt, Hurth; Jurgen Koch, Bruhl, and Hermann Glaser, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 23, 1977, Ser. No. 854,466

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1976, 2653985

Int. Cl.[2] B01J *23/10, 23/72, 23/78, 23/84*

U.S. Cl. 252—471 **10 Claims**

1. Catalyst for reducing carbon monoxide by means of hydrogen with the resultant formation of a mixture of hydrocarbons having substantially from 1 to 4 carbon atoms, said catalyst having been made by

(A) precipitating a salt of a hydrocyanic acid of the general formula $Me_I Me_{II}(CN)_X$ in which the cationic component Me_I stands for at least one of the elements selected from the group consisting of Ce, Cu, Ni, Fe, Mn, Zn, Ag and K or Ca or Mg together with NH_4; the anionic component Me_{II} stands for at least one of the elements selected from the group consisting of Cu, Co, Ni, Fe, Mn, Zn and Ag; and X stands for a number equivalent the sum of the metal valencies; Me_I and Me_{II} being not permitted to stand alone for iron alone, or for a mixture of iron with copper or cobalt with copper;

(B) separating and drying the salt so precipitated; and

(C) forming the catalyst by

(a) subjecting the salt to thermal decomposition at a temperature of 200° to 500° C. under vacuum or under a pressure of up to 100 atmospheres absolute or

(b) subjecting the salt in contact with hydrogen or a mixture of hydrogen and carbon monoxide to a temperature of 200° to 500° C. and a pressure of 1 to 100 atmospheres absolute.

4,186,113

LOW IRRITATING DETERGENT COMPOSITIONS

Robert J. Verdicchio, Succasunna, N.J., and Maria C. Rodon, Raleigh, N.C., assignors to Johnson & Johnson, New Brunswick, N.J.

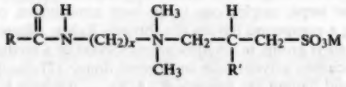
Filed Apr. 3, 1978, Ser. No. 892,803

Int. Cl.[2] C11D *1/92, 1/94*

U.S. Cl. 252—526 **7 Claims**

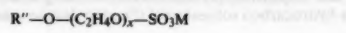
1. A low irritating liquid detergent composition wherein the active ingredients consist essentially of:

(a) from about 1 to 15% by weight of the total composition of a sulfobetaine of the formula



wherein R is an alkyl group of from 8 to 18 carbon atoms or mixtures thereof, R' is OH or H, x is an integer from 1 to 3 and M is selected from the group consisting of alkali metals, alkaline earth metals and alkanol amine salts selected from the group consisting of mono-, di- and triethanolamine salts; and

(b) from about 1 to 15% by weight of the total composition of an anionic detergent of the formula



wherein R'' is a branched or straight chain saturated or unsaturated hydrocarbon radical, alkylaromatic hydrocarbon radical or alkylaryl hydrocarbon radical containing from 6 to 20 carbon atoms, x is an integer from 1 to 5 and M is selected from the group consisting of alkali metals, alkaline earth metals and alkanol amine salts;

wherein the total of (a) and (b) does not exceed about 20% by weight of the total composition.

4,186,114
FREE-FLOWING GRANULAR DETERGENT COMPOSITIONS CONTAINING OLEFIN SULFONATES

Masayoshi Nakamura, Koshigaya; Mitsuyoshi Yazaki, Yachiyo, and Toshiaki Ogoshi, Funabashi, all of Japan, assignors to The Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Sep. 5, 1978, Ser. No. 939,455

Claims priority, application Japan, Sep. 12, 1977, 52-108782

Int. Cl.[2] C11D *1/14, 17/06*

U.S. Cl. 252—536 **7 Claims**

1. A granular detergent composition consisting essentially of

I. from 10 to 31% by weight of synthetic organic surfactant component consisting essentially of a mixture of

a. alpha-olefin sulfonate having from 12 to 18 carbon atoms, and

b. poly(oxyethylene)-poly(oxypropylene) alkyl ether in which the alkyl has from 9 to 15 carbon atoms, and containing from 6 to 22 ethylene oxide units and from 2 to 8 propylene oxide units,

the weight ratio of component a/component b being in the range of from 10/3 to 1/1,

II. the balance is essentially water-soluble inorganic builder.

3. A granular detergent composition according to claim 1, in which said builder is mainly sodium pyrophosphate.

4,186,115
NOVEL RADIATION CURABLE COATING COMPOSITIONS FOR PRESSURE-SENSITIVE TRANSFER SHEETS

Sydney M. Spatz, Circleville; Robert C. Hydell, and Gerald T. Davis, both of Chillicothe, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Division of Ser. No. 697,019, Jun. 17, 1976, Pat. No. 4,138,508. This application Jun. 14, 1978, Ser. No. 915,506

Int. Cl.[2] C08L *91/00*

U.S. Cl. 260—22 R **2 Claims**

1. A coating composition for coating a substrate to form a pressure-sensitive, carbonless transfer sheet comprising:

(a) at least one color precursor dissolved in a carrier oil, said carrier oil being a weakly polar solvent having a boiling point of from about 180° C. to about 300° C., said color precursor being of the electron donor type, said color precursor being reactive with color developers of the electron acceptor type to form a color and said color precursor being selected from the group consisting of lactone phthalides, lactone fluoranes and mixtures thereof; and

(b) a liquid radiation curable substance, said liquid radiation curable substance being selected from the group consisting of: isocyanate modified acrylic, methacrylic and itaconic acid esters of polyhydric alcohols, acrylic preopolymers derived from partial esterification of pentaerythritol with acrylic acid and acrylic acid esters and mixtures thereof,

said liquid radiation curable substance being curable to a frangible resin upon exposure to radiation,

said coating composition having a viscosity in the range of about 1000 cps. to about 3500 cps.

4,186,116
AIR-DRYING AND OVEN-DRYING ACRYLATE LACQUER BINDERS

Rolf Dhein; Lothar Fleiter, and Wolfgang Beer, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 20, 1978, Ser. No. 917,378

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1977, 2728568

Int. Cl.[2] C09D *3/52, 3/80, 3/81*

U.S. Cl. 260—23 AR **3 Claims**

1. An air-drying and oven-drying lacquer binder based on a copolymer having copolymerised units of

5 to 40% by weight of styrene,

10 to 50% by weight of at least one hydroxyalkyl(meth)acrylate with 2 to 4 carbon atoms in the alkyl group, and

10 to 40% by weight of at least one (meth)acrylic acid ester with 1 to 10 carbon atoms in the alcohol component, esterified with

10 to 50% by weight, based on the copolymer and drying fatty acid and dicarboxylic acid anhydride, of a drying fatty acid,

from 10 to 70 mole % of the hydroxyl groups of the incorporated hydroxyalkyl(meth)acrylate units having been esterified with the drying fatty acid and thereafter from 0.5 to 20 mole % of the hydroxyl groups of the incorporated hydroxyalkyl(meth) acrylate units having been reacted with from 0.5 to 10% by weight, based on the lacquer binder, of at least one dicarboxylic acid cyclic anhydride to form the semiester of the corresponding dicarboxylic acid having an overall acid number of from 5 to 30, the overall acid number being composed of an acid number of from 1 to 10, as determined after esterification with the drying fatty acid and emanating from the free fatty acid, and of acid number of from 1 to 29, as determined on the solvent-free lacquer binder (end product) and emanating from formation of the semiester.

4,186,117
CATHODIC ELECTRODEPOSITION COATING COMPOSITIONS CONTAINING DIELS-ALDER ADDUCTS

Ivan H. Tsou, Bloomfield Hills, Mich., assignor to Grow Chemical Corp., Troy, Mich.

Division of Ser. No. 859,296, Dec. 12, 1977, Pat. No. 4,148,704. This application Oct. 4, 1978, Ser. No. 948,397

Int. Cl.[2] C09D *3/58, 5/40*

U.S. Cl. 260—23 AR **7 Claims**

1. An organic coating composition comprising a dispersion, solution or suspension of a coating composition characterized by:

(a) the reaction product of a conjugated fatty acid ester and an acrylic containing monomer; and

(b) Formula A within the molecule, being the reaction product of reacting an amine with an oxirane ring;

wherein Formula A is:

$$-CH_2-C(Z)-CH_2-N>$$

wherein Z is independently selected from the group consisting of hydrogen, hydroxyl, alkoxy of from one to 6 carbon atoms; acyloxy of from one to 6 carbon atoms; (=O), $-OR']_nH$, $-OR']_nOH$, and $-OR'(CH_2OH)]_nOH$; wherein R' is a saturated alkylene of from 2 to 4 carbon atoms and n is a number from 1 to 6.

4,186,118

PROCESS FOR THE PREPARATION OF MODIFIED AQUEOUS SYNTHETIC RESIN DISPERSIONS

Artur Reischl; Wolfgang Wenzel, and Dieter Dieterich, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 8, 1978, Ser. No. 875,958

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1977, 2708442

Int. Cl.[2] C08L *75/02, 75/04*

U.S. Cl. 260—29.2 TN **6 Claims**

1. A process for preparing modified aqueous synthetic resin dispersions with a solids content of from 10 to 60%, by weight, wherein the proportion of nonpolyurethane polymerization products comprises up to 70% by weight based on the total solids content, comprising introducing, 1.5 to 80% by weight, based on the total solids content in the modified synthetic resin dispersions, of organic diisocyanates having an average molecular weight of 400 or less and which diisocyanates are liquid at room temperature into polyurethane-containing, non-sedimenting, aqueous synthetic resin dispersions, optionally in the presence of catalysts which accelerate the isocyanate polyaddition reaction and/or the dimerization of isocyanate groups and/or the carbodiimidization of isocyanate groups and/or the trimerization of isocyanate groups, mixing the organic diisocyanate with the aqueous dispersion at a temperature at which no visible foaming occurs, maintaining the temperature after addition of all the diisocyanate until at least 50% of the isocyanate groups in the added diisocyanate have undergone reaction, and if desired, completing the reaction by subsequently heating to temperatures up to 100° C.

4,186,119

POLYURETHANES PREPARED FROM ALCOHOLS AND HYDROCARBON POLYISOCYANATES USED IN TEXTILE WET TREATMENT PROCESSES

Jose Canela, Therwill, and Hans Gerber, Allschwil, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 852,131, Nov. 16, 1977, abandoned. This application Nov. 28, 1978, Ser. No. 964,163

Int. Cl.[2] C08G *18/50*

U.S. Cl. 260—29.2 TN **22 Claims**

1. A wet treatment process for synthetic or semi-synthetic textile material comprising employing a aqueous wet treatment liquor containing a polyurethane, which polyurethane is a reaction product of a compound or mixture of compounds 1, the or each compound 1 being a derivative of ammonia; a polyamine; urea; a polyamide; an aminoamide; an aminoalcohol; or a polyol containing up to 10 carbon atoms and up to 6 hydroxyl groups per molecule; in which at least three of the active hydrogen atoms of the amino, hydroxyl and/or amido moieties present are replaced by the same or different groups of formula 1a,

$$—Alkylene\text{-}O)_nH \qquad 1a$$

in which

each Alkylene, independently, is straight or branched chain ($C_{2\text{-}4}$)-alkylene, unsubstituted or substituted by a phenyl group, and

n is an integer 1 to 100,

and a compound or mixture of compounds 2, the or each compound 2 being a hydrocarbon polyisocyanate, in a molar ratio of compound(s) 1: compound(s) 2 of $\Sigma p:\Sigma r$, p being the moles of the or each compound 1 and r being the moles of the or each compound 2 reacted, Σp and Σr being so chosen that $\Sigma(p.q) \div \Sigma(r.m) = 1.5$ to 21 and $\Sigma p \leqq \Sigma(r.m)$, q being the number of groups of formula 1a per molecule of the or each compound 1 and m being the number of isocyanate groups per molecule of the or each compound 2, and which polyurethane is water-soluble or -dispersible to a degree at least 1 g/l at 20° C., and whose 1 g/l aqueous solution or dispersion at 20° C. exhibits a viscosity of no more than 100 cp.

4,186,120

PROCESS FOR PRODUCING FINELY DIVIDED AQUEOUS EMULSIONS FROM MATERIALS OF LIMITED WATER SOLUBILITY

John Ugelstad, Trondheim, Norway, assignor to SINTEF (Selskapet for industriell og teknisk forskning ved NTH), Trondheim, Norway

Filed Nov. 22, 1977, Ser. No. 853,841

Claims priority, application Norway, Nov. 22, 1976, 763984

Int. Cl.[2] C08L *33/00*

U.S. Cl. 260—29.6 RB **5 Claims**

1. Process for producing finely divided, aqueous emulsions of a material of limited water solubility which comprises absorbing said material by diffusion into pre-formed particles dispersed in water as a seed latex formed by the emulsion polymerisation of a vinyl compound under conditions causing said latex to include in the particles 10–100% oligomers having a molecular weight of 200–10000, said particles having the ability to take up 20–500 times their own volume of said material.

4,186,121

PROCESS FOR OBTAINING COLLOIDAL DISPERSION OF POLYMERIC TETRAFLUOROETHYLENE

Subhash V. Gangal, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Jun. 19, 1978, Ser. No. 916,917

Int. Cl.[2] C08L *27/18*

U.S. Cl. 260—29.6 F **5 Claims**

1. In a process for obtaining a colloidal dispersion of polytetrafluoroethylene by polymerizing tetrafluoroethylene in an aqueous medium in the presence of an anionic, substantially non-telogenic fluorinated carboxylate dispersing agent containing 7–20 carbon atoms, and an ionic initiator, present initially in a amount of between about 2 and 270 ppm (based on water present), and at a temperature of between about 60° C. and 120° C. and at a pressure of between about 30 and 1000 psi, the improvement which comprises reducing formation of coagulum by employing in the aqueous medium an aliphatic, substantially non-telogenic carboxylic acid selected from the group consisting of malonic acid, succinic acid, adipic acid, acetic acid, glutaric acid, formic acid and hydroacetic acid, said acid being present in an amount between 10 and 150 times the amount of initiator present based on weight.

4,186,122

ELECTRICAL INSULATING COATINGS

Yasunori Okada; Yuichi Osada; Mineo Nakano; Shozo Kasai; Shigeo Tachiki; Nobuyuki Hayashi, and Masahiro Abo, all of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Japan

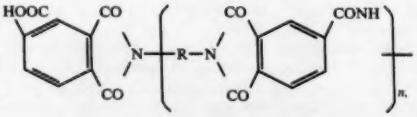
Filed Aug. 29, 1977, Ser. No. 828,658

Claims priority, application Japan, Sep. 3, 1976, 51-105633; Jun. 17, 1977, 52-72550

Int. Cl.[2] C08K *5/10*

U.S. Cl. 260—31.4 R **8 Claims**

1. An electrical insulating composition consisting essentially of a polyester-amide-imide resin or a polyester-imide resin prepared by reacting a polyvalent carboxylic acid from the group consisting of (a) amide-imide acids containing amide bonds and imide rings in the molecule represented by the formula



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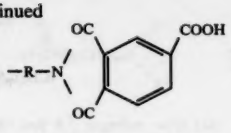
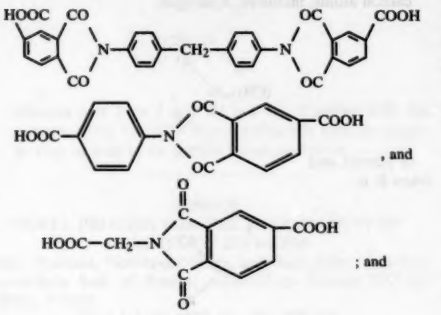


wherein n, is 0.25 to 4; and R is a divalent organic group; (b) imide dicarboxylic acids containing one or more imide rings in the molecules represented by the formulas:



(c) mixtures of (a) and (b), together with (d) at least one polyvalent carboxylic acid or its derivative other than (a) and (b), with at least one polyhydric alcohol and a solvent containing at least 60% by weight of a polyhydric alcohol derivative selected from the group consisting of

$R_1COO(CHR_2CH_2O)_{n2}H$,
$R_1COO(CHR_2CH_2O)_{n2}COR_3$,
$R_1O(CHR_2CH_2O)_{n2}COR_3$,
$R_1O(CHR_2CH_2O)_{n2}R_4$, and mixtures thereof,

wherein R_1, R_3 and R_4 are independently lower alkyl, aryl or aralkyl; R_2 L is hydrogen or methyl; and $\overline{n_2}$ is an integer of 1 to 3.

4,186,123

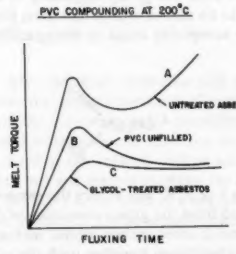
FILLED POLYMERIC COMPOSITION

John H. Kietzman, Golden, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 511,342, Oct. 2, 1974, abandoned, and a continuation-in-part of Ser. No. 618,713, Oct. 1, 1975, abandoned. This application Dec. 8, 1975, Ser. No. 638,249

Int. Cl.² C08K *3/10, 3/18, 3/34, 5/05*

U.S. Cl. 260—37 SB **30 Claims**



1. A plastic composite composition having both good internal reinforcement and impact strength, which comprises:

(a) a polymeric resin matrix, said resin being selected from the group consisting of acrylic, polyolefin, polyvinyl and polystyrene thermoplastic resins and phenolic, epoxy, polyurethane and silicone thermosetting resins;

(b) nonamphibole asbestos reinforcing fiber in a concentration of 5 to 85 phr; and

(c) coated on said fiber a glycol in a concentration of 1 to 75 percent by weight based on fiber, said glycol being stable and liquid up to and at the processing temperature of said resin, compatible but chemically unreactive and immiscible with said resin, of low hygroscopicity, and liquid at temperatures of less than 50° C., wherein said fiber is coated with said glycol prior to admixture thereof with said resin matrix.

28. Nonamphibole asbestos fiber coated with a glycol selected from the group consisting of ethylene glycol, propylene glycol, and those polyethylene glycols having molecular weights not greater than 1500, said glycol being present in a concentration of 1 to 75 percent by weight based on fiber, wherein complete coating of said asbestos fiber is assured by saturation of the asbestos fiber with a solution of glycol diluted with water or by coating the asbestos fiber with glycol alone by means of high intensity mixing.

4,186,124

NOVEL PIGMENT GRINDING VEHICLE

Karl F. Schimmel, Verona, Pa.; Lance C. Sturni, Delaware, Ohio, and Martin J. Robles, Hyattsville, Md., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 601,109, Aug. 1, 1975, abandoned. This application Jan. 13, 1978, Ser. No. 869,197

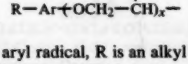
Int. Cl.² C08L *63/00*

U.S. Cl. 260—37 EP **10 Claims**

1. A polymeric product suitable as a pigment grinding vehicle comprising the acidified reaction product of:

(A) a polymeric polyepoxide having a 1,2-epoxy equivalency greater than one,

(B) an organic tertiary amine containing an alkylaryl-polyether moiety having the following structural formula:



where Ar is an aryl radical, R is an alkyl radical containing from 1 to 30 carbon atoms, R' is hydrogen or lower alkyl containing from 1 to 5 carbon atoms, and x is equal to 3 to 20.

4,186,125

METHOD FOR IMPROVING THE IMPACT STRENGTH OF A PLASTICS MATERIAL

Bengt Lundgren, Ulricehamn, Sweden, assignor to SKF Nova AB, Gothenburg, Sweden

Filed Mar. 6, 1978, Ser. No. 883,508

Claims priority, application Sweden, Mar. 28, 1977, 7703487

Int. Cl.² C08K *3/08, 7/14*

U.S. Cl. 260—42.18 **7 Claims**

1. In a method for improving the impact strength of a composition comprising a matrix of plastic which is hard at ambient temperatures and which contains reinforcing fibers and particulate metal, the improvement which comprises incorporating said particulate metal in the form of deformable particles of about 2–20 μm thickness and having a length of about 10–20 times said thickness, said metal particles constituting about 10 to about 80% by weight of said composition and being present in such an amount that said particles are in contact with each other, whereby the impact resistance of said composition is synergistically greater than the additive impace resistance imparted to the matrix by either said reinforcing fibers or deformable metal particles due to the absorption of impact energy as work of deformation of said particles.

4,186,126
SULFONATE ANTIOXIDANTS FOR SYNTHETIC AND NATURAL RUBBER

John J. Messick, #28 Hacienda de Jiquilpan, Mexico City, Mexico

Filed Apr. 11, 1978, Ser. No. 895,403
Int. Cl.[2] C08K 5/42
U.S. Cl. 260—45.9 AA 19 Claims

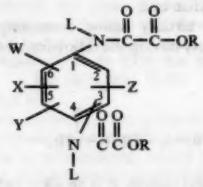
1. A composition containing a material selected from the group of synthetic rubber, natural rubber, and mixtures thereof and as an antioxidant in an amount sufficient to retard oxidation of said material up to about 3% by weight of an alkanolamine salt of a sulfonic acid selected from the group of arylsulfonic acids, alkyl substituted arylsulfonic acids, and mixtures thereof, provided said sulfonic acid contains at least 10 carbon atoms, said alkanolamine is selected from the group of monoalkanolamines, dialkanolamines and mixtures thereof, and wherein said alkanolamine contains up to 4 carbon atoms, and wherein only hydrogen and alkanol groups are directly attached to nitrogen atom of said alkanolamine.

4,186,127
N-HETERO SUBSTITUTED DIOXAMIC ACID COMPOUNDS

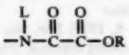
Charles M. Hall, and John B. Wright, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 714,573, Aug. 16, 1976, abandoned, which is a division of Ser. No. 382,762, Jul. 26, 1973, Pat. No. 3,993,679, which is a continuation-in-part of Ser. No. 317,005, Dec. 20, 1972, abandoned. This application Jul. 27, 1977, Ser. No. 819,319
Int. Cl.[2] C07D 295/22
U.S. Cl. 260—239 B 3 Claims

1. A compound of the formula

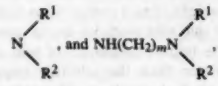


wherein Y and Z are hydrogen, W, and X can be the same or different and are selected from the group consisting of hydrogen, alkyl from one to six carbon atoms, inclusive, phenyl, alkoxy with the alkyl group having from one to six carbon atoms, inclusive, hydroxy, nitro, halogen, trifluoromethyl, cyano with the proviso that cyano is meta to both

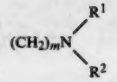


groups, and

wherein Q is selected from OD,

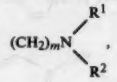


wherein D is selected from the group consisting of hydrogen, alkyl from one to six carbon atoms, inclusive, phenyl,



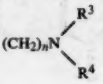
and a pharmaceutically acceptable metal or amine cation with the proviso that

where R is alkyl from one to six carbon atoms, inclusive, or phenyl, and Q is OD, then D is alkyl from one to six carbon atoms, inclusive, hydrogen,



or phenyl, and

when R is



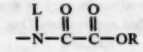
and Q is OD, then D is the same as R,

and with the further proviso that when R is hydrogen or a pharmaceutically acceptable metal or amine cation and Q is OD, then D is the same as R,

m is 2 or 3, R^1 and R^2 are the same or different and are selected from the group consisting of hydrogen, alkyl from one to three carbon atoms, inclusive, and

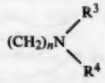
R^1 and R^2, when taken together with the nitrogen atom to which they are attached, form an alicyclic ring of four to six carbon atoms, with the additional overall proviso that at least one of W, X, Y, and Z is not hydrogen when L is hydrogen;

L is selected from the group consisting of hydrogen, alkyl of from one to six carbon atoms, inclusive, benzyl, and monosubstituted benzyl wherein the substituent is selected from the group consisting of alkyl from one to four carbon atoms, inclusive, and halogen; the



group is located at the 3 or 4 position;

R is selected from the group consisting of hydrogen, alkyl from one to six carbon atoms, inclusive, phenyl, a pharmaceutically acceptable metal or amine cation, and

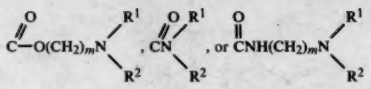


where n is 2 or 3, R^3 and R^4 are the same or different and are selected from the group consisting of hydrogen, alkyl of from one to three carbon atoms, inclusive, and

R^3 and R^4, when taken together with the nitrogen atom to which they are attached, form an alicyclic ring of four to six carbon atoms; and

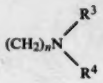
with the further additional overall proviso that at least one of

(1) W, X, Y or Z is



wherein m is 2 or 3 and R^1 and R^2, together with the nitrogen to which they are attached, form an alicyclic ring of four to six carbon atoms, inclusive; or

(2) R is



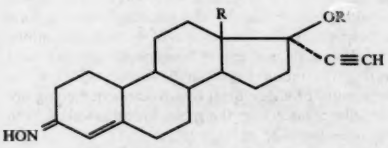
wherein n is 2 or 3 and R^3 and R^4, together with the nitrogen atom to which they are attached form an alicyclic ring of four to six carbon atoms, inclusive.

4,186,128
NOVEL PROCESS FOR THE PREPARATION OF 3-OXIMES OF STEROIDS

Julien Warnant, Neuilly-sur-Seine, and Jean Jolly, Fontenay-sous-Bois, both of France, assignors to Roussel UCLAF, Paris, France

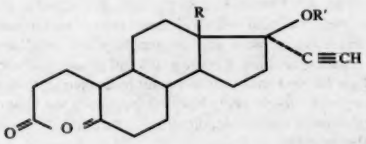
Filed Jul. 24, 1978, Ser. No. 926,865
Claims priority, application France, Aug. 31, 1977, 77 26432
Int. Cl.[2] C07J *1/00*
U.S. Cl. 260—239.5 **7 Claims**

1. A process for the preparation of 3-oximes of the formula



I

wherein R is selected from the group consisting of methyl and ethyl and R′ is selected from the group consisting of hydrogen and acyl of an organic carboxylic acid of 2 to 8 carbon atoms comprising reacting a compound of the formula



wherein R and R′ have the above definition with a secondary amine selected from the group consisting of pyrrolidine and morpholine to form the corresponding 3-pyrrolidyl or 3-morpholinyl-17α-ethynyl-Δ^4-gonene and then reacting the latter which has been isolated or not isolated, with an acid and finally with hydroxylamine or a salt thereof to obtain the corresponding compound of formula I in the form of a mixture of syn and anti isomers which, if desired, can be separated into individual isomers.

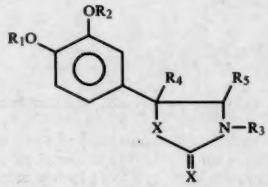
7. A compound selected from the group consisting of 3-pyrrolidyl-13β-ethyl-17β-acetoxy-17α-ethynyl-$\Delta^{3,5}$-gonadiene, 3,5-bisethylenedioxy-4,5-seco-13β-ethyl-17β-acetoxy-17α-ethynyl-gonane and 4,5-seco-13β-ethyl-17β-acetoxy-17α-ethynyl-gonane-3,5-dione.

4,186,129
5-(SUBSTITUTED PHENYL)-OXAZOLIDINONES AND THEIR SULFUR ANALOGS

Andreas Huth; Ralph Schmiechen; Wolfgang Kehr; Gert Paschelke; Helmut Wachtel; Herbert H. Schneider, and Dieter Palenschat, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Nov. 30, 1977, Ser. No. 855,867
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1976, 2655369
Int. Cl.[2] C07D *263/38, 263/46, 277/34;* A61K *31/42*
U.S. Cl. 548—186 **29 Claims**

1. A 5-(substituted phenyl)-oxazolidinone and its sulfur analog of the Formula



wherein

R_1 is lower alkyl, C_{3-7} cycloalkyl or C_{3-7} cycloalkylalkyl;

R_2 is hydrogen, lower alkyl, C_{3-7} cycloalkyl, C_{3-7} cycloalkylalkyl, aryl, ar-C_{1-4} alkyl, C_{2-5} alkenyl, 2- or 3-tetrahydrofuranyl, 2- or 3-tetrahydrothienyl or 2-tetrahydropyranyl;

R_3 is hydrogen, lower alkyl, C_{2-5} alkenyl, C_{2-5} alkynyl, aryl, ar-C_{1-4}-alkyl, or acyl

R_4 is hydrogen or lower alkyl;

R_5 is hydrogen, lower alkyl, or lower alkoxycarbonyl; and

X is oxygen or sulfur; and

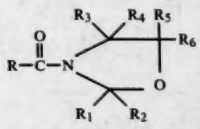
wherein "lower" refers to 1–6 carbon atoms; and aryl and ar- are each phenyl or naphthyl.

4,186,130
N-(HALOALKANOYL) OXAZOLIDINES

Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 566,019, Apr. 7, 1975, Pat. No. 3,959,304, which is a continuation-in-part of Ser. No. 484,514, Jul. 1, 1974, abandoned, which is a continuation of Ser. No. 356,548, May 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 297,582, Oct. 13, 1972, abandoned. This application Feb. 6, 1976, Ser. No. 655,938
Int. Cl.[2] C07D *263/04, 277/04;* A01N *3/00*
U.S. Cl. 548—215 **27 Claims**

1. A compound having the formula



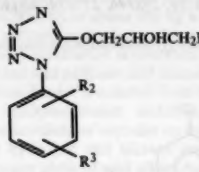
in which R is selected from the group dichloromethyl, tribromomethyl, trichloromethyl, 1-bromoethyl, monobromomethyl, 1,2,4,4-tetrabromopentyl, 2-chloroethyl, 1,2-dibromoethyl, 2-bromoethyl, ω-bromodecyl, 3-chloropropyl, 2-chloropropyl, 1-bromopropyl, 1-bromobutyl, 5-bromopentyl; R_1 is methyl; R_2 is selected from the group methyl, ethyl, t-butyl, i-propyl; and R_3, R_4, R_5 and R_6 are each hydrogen; provided that when R is dichloromethyl, R_2 is not methyl.

4,186,131
PHENYLTETRAZOLYLOXY PROPANOLAMINES

William E. Kreighbaum, and William T. Comer, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Continuation-in-part of Ser. No. 789,481, Apr. 21, 1977, abandoned. This application Mar. 24, 1978, Ser. No. 889,780
Int. Cl.[2] C07D *257/04;* A61K *31/41*
U.S. Cl. 548—251 32 Claims

1. A compound having the formula



the pharmaceutically acceptable acid addition salts thereof wherein

R^1 is selected from the group consisting of 2-(3-indolyl)-1,1-dimethylethyl, adamantyl, alkyl having 1 to 12 carbon atoms, hydroxyalkyl having 2 to 12 carbon atoms having the hydroxyl group attached to a carbon atom other than that carbon atom attached to the nitrogen atom, alkenyl having 3 to 12 carbon atoms, cycloalkyl having 3 to 6 ring atoms, cycloalkylalkyl having 4 to 12 carbon atoms including 3 to 6 ring atoms, cycloalkenyl having 5 to 6 ring atoms, carbocyclic aralkyl having 7 to 12 carbon atoms, substituted carbocyclic aralkyl having 7 to 18 carbon atoms, carbocyclic aryloxyalkyl having 8 to 12 carbon atoms, and substituted carbocyclic aryloxyalkyl having 8 to 18 carbon atoms wherein said substituted aralkyl and said substituted aryloxyalkyl groups each have 1 or 2 ring substituents selected from the group consisting of halogen, alkoxy having 1 to 6 carbon atoms, alkyl having 1 to 6 carbon atoms, and alkenyl having 3 to 6 carbon atoms wherein said ring substituents are sterically compatible;

R^2 is hydrogen or methyl, and

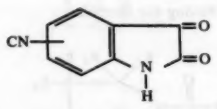
R^3 is hydrogen, methyl, halogen, nitro, or acetamido.

4,186,132
ISATIN PRODUCTS

Paul G. Gassman, St. Paul, Minn., and Berkeley W. Cue, Groton, Conn., assignors to The Regents of the University of Minnesota, Minneapolis, Minn.

Filed Apr. 15, 1977, Ser. No. 787,992
Int. Cl.[2] C07D *209/38*
U.S. Cl. 260—325 R 5 Claims

1. A compound of the formula

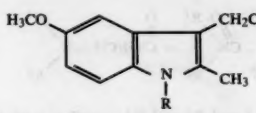


4,186,133
PROCESS FOR THE PREPARATION OF AN INDOLE-3-ACETOHYDROXAMIC ACID

Teresio Tamietto, Turin, Italy, assignor to Istituto Biologico Chemioterapico "ABC" S.p.A., Turin, Italy

Filed Feb. 23, 1978, Ser. No. 880,517
Int. Cl.[2] C07D *209/12*
U.S. Cl. 260—326.13 R 14 Claims

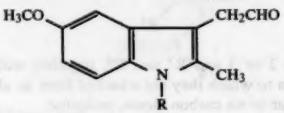
1. A process for the preparation of an indole-3-acetohydroxamic acid having the formula:



(I)

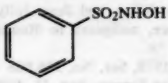
in which R is selected from: the p-chlorobenzoyl radical; benzyl radical; allyl radical; and a hydrogen atom, the process comprising the following sequence of steps:

(a) preparing a solution of a corresponding aldehyde having the formula:



(II)

wherein R has the same signification as above and of benzenesulfohydroxylamine, that is:



(III)

in an organic solvent, miscible with water;

(b) adding an aqueous solution of an alkali metal hydroxide having a strength of at least 1.5 N to the said solution kept at a pH value not exceeding 8 and kept under agitation at a temperature of from 0° C. to 8° C. to induce the reaction of the said aldehyde and the said hydroxylamine to form the corresponding alkali metal salts of the required indole-3-acetohydroxamic acid and of benzenesulphinic acid and recovering the indole-3-aceto-hydroxamic acid salt the molar quantity of alkali metal hydroxide added being not substantially greater than the molar quantity of said hydroxylamine dissolved in stage (a);

(c) liberating said indole-3-acetohydroxamic acid from its salt recovered from stage (b) by the addition of a water-soluble acid; and

(d) precipitating said indole-3-acetohydroxamic acid by addition of water to the solution obtained in step (c),

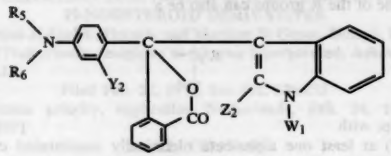
said organic solvent used in stage (a) being inert to said aldehyde, said benzenehydroxylamine, said aqueous alkali metal hydroxide and said alkali metal salts of said indole-3-acetohydroxamic acid and benzenesulphinic acid under said reaction conditions of stage (b) and to said acid added in stage (c) and said indole-3-acetohydroxamic acid and said organic solvent being selected from the group consisting of dimethyl sulfoxide, dimethylformamide, dioxan and tetrahydrofuran.

4,186,134
3-INDOLYL-3-PHENYL-PHTHALIDES

Robert Garner, Bury, England, and Jean C. Petitpierre, Kaiseraugst, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 686,863, May 17, 1976, Pat. No. 4,062,866, which is a continuation of Ser. No. 471,395, May 20, 1974, abandoned. This application Sep. 19, 1977, Ser. No. 834,078
Int. Cl.[2] C07D *209/20*
U.S. Cl. 260—326.13 H 2 Claims

1. A phthalide compound of the formula



wherein R_5 and R_6 independently of the other represent alkyl with 1 to 4 carbon atoms or benzyl, Z_2 represents methyl or phenyl, Y_2 represents alkanoyloxy with 2 to 4 carbon atoms and W_1 represents methyl or ethyl.

4,186,135

SUBSTITUTED 2,3-ALKYLENE BIS (OXY) BENZAMIDES AND DERIVATIVES AND METHOD OF PREPARATION

Michel Thominet; Gerard Bulteau, both of Paris; Jacques Acher, Itteville, and Claude Collignon, Saint Remy les Chevreuse, all of France, assignors to Societe D'Etudes Scientifiques et Industrielles de L'ile-de-France, Paris, France

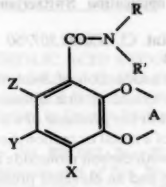
Filed Aug. 2, 1977, Ser. No. 821,123

Claims priority, application France, Aug. 4, 1976, 76 23835

Int. Cl.[2] C07D *403/12;* A61K *31/40*

U.S. Cl. 260—326.34 **36 Claims**

1. Substituted 2,3-alkylene bis(oxy)benzamides, their pharmaceutically acceptable acid addition salts, their quaternary ammonium salts, their oxides, and their dextrorotatory and levorotatory isomers, having the formula:



wherein

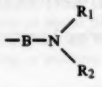
A is a C_{1-3} alkylene group;

X is selected from the group consisting of hydrogen, halogen, C_{1-4} alkoxy, nitro, amino, and acetamino, and when X is alkoxy A is not methylene;

Y is selected from the group consisting of hydrogen, halogen, nitro, amino, acetamino, C_{1-4} alkylsulfonyl, sulfamoyl, C_{1-4} alkylsulfamoyl, and C_{1-4} dialkylsulfamoyl;

Z is selected from the group consisting of hydrogen, nitro, amino, and acetamino;

R is a group having the formula:



wherein

B is a C_{1-3} alkylene group;

R_1 is joined to B to form a pyrrolidinyl group;

R_2 is a C_{1-4} alkyl, C_{2-4} alkenyl, cycloalkyl or benzyl group; and

R' is a hydrogen atom, a C_{1-4} alkyl, adamantyl or benzyl group.

4,186,136

NOVEL BENZOTHIENYL AMINO (PROPYL AND BUTYL) KETONES, A METHOD OF PREPARATION THEREOF AND THEIR APPLICATION TO THERAPEUTICS

Max F. Robba, and Michel Aurousseau, both of Paris, France, assignors to Innothera, Arcueil, France

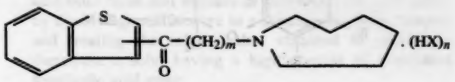
Filed Mar. 31, 1976, Ser. No. 672,109

Claims priority, application France, Apr. 3, 1975, 75 10422

Int. Cl.[2] C07O *333/52, 207/12;* A01N *9/00, 9/22*

U.S. Cl. 544—146 **11 Claims**

1. A compound having the formula



wherein m is 3 or 4,

n is zero or one, and

HX is selected from the group consisting of hydrochloric acid, bromhydric acid, sulfuric acid, phosphoric acid, boric acid, oxalic acid, maleic acid, malic acid, fumaric acid, citric acid, embonic acid, methanesulfonic acid, acetylsalicylic acid, nicotinic acid, parachlorophenoxyacetic acid, parachlorophenoxyisobutyric acid, methyl bromide, methyl iodide, ethyl bromide, butyl bromide and benzyl bromide.

4,186,137

PROCESS FOR PREPARING 3-THIENYL-ACETATE DERIVATIVES

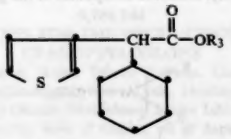
Charles Pigerol; Marie-Madeleine Chandavoine; Michel Chignac, and Paul de Cointet de Fillain, all of Sisteron, France, assignors to Labaz, Paris, France

Continuation-in-part of Ser. No. 651,174, Jan. 21, 1976, abandoned, which is a continuation of Ser. No. 549,938, Feb. 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 501,855, Aug. 29, 1974, abandoned. This application Mar. 17, 1977, Ser. No. 778,498

Int. Cl.[2] C07D *333/24*

U.S. Cl. 549—79 **1 Claim**

1. In a process for the preparation of a thiophene compound corresponding to the formula:



wherein R_3 represents methyl or ethyl, by the reaction in one step between methyl or ethyl 3-thienyl-acetate and cyclohexyl bromide at a temperature between −15° C. and −10° C. in the presence of sodium hydride in dimethylformamide, the improvement which comprises:

(a) premixing said methyl or ethyl 3-thienyl-acetate with cyclohexyl bromide, and

(b) adding at −15° C. said methyl or ethyl 3-thienyl-acetate/cyclohexyl bromide mixture to said mixture of sodium hydride in dimethylformamide.

4,186,138

PREPARATION OF CHROMAN-2-ACETIC ACIDS

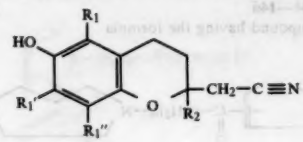
Noal Cohen, Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 873,184, Jun. 30, 1978, abandoned. This application Dec. 15, 1978, Ser. No. 970,036

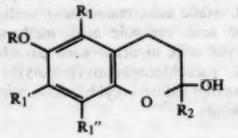
Int. Cl.[2] C07D *311/72*

U.S. Cl. 260—345.5 **2 Claims**

1. A process for preparing a compound of the formula



wherein R_1, R_1' and R_1'' are hydrogen or lower alkyl; and R_2 is lower alkyl;
comprising reacting a compound of the formula



wherein R is hydrogen or taken together with its attached oxygen atom forms an ester protecting group removable by hydrolysis; and R_1, R_1' and R_1'' and R_2 are as above
with acetonitrile in the presence of a strong base, said reaction being carried out at reflux temperatures.

4,186,139

HYDROXYALKYL HYDROXY-AROMATIC CONDENSATION PRODUCTS AS FUEL AND LUBRICANT ADDITIVES

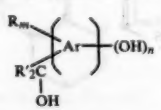
Charles P. Bryant, Euclid, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Division of Ser. No. 678,101, Apr. 19, 1976, Pat. No. 4,108,784, which is a continuation-in-part of Ser. No. 459,750, Apr. 9, 1974, abandoned. This application Aug. 11, 1978, Ser. No. 932,976

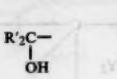
Int. Cl.[2] C07D *307/60*

U.S. Cl. 260—346.74 **20 Claims**

1. A reaction product made by the process comprising reacting at a temperature ranging from about 15° C. to the decomposition temperature of the reactant or product present having the lowest decomposition temperature (A) at least one alpha haloalkyl hydroxyl aromatic compound of the general formula



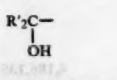
wherein Ar is a hydrocarbyl aromatic nucleus of 6 to about 30 carbon atoms, or a substituted analog of such an aromatic nucleus substituted with one or more up to 3 each of lower alkoxy, lower alkylthio, chloro, or nitro substituents, each R is a nonfused hydrocarbyl group of about 25 to about 700 carbon atoms, each R' is independently a hydrogen atom, an alkyl group of 1 to 36 carbon atoms, or a halogen-substituted alkyl group of 1 to about 36 carbon atoms, n is 1 to 3 and m is 1 to 5 with the provisos that (i) the total number of carbon atoms in both the R' groups does not exceed 36 and (ii) where m exceeds 1, one of the R groups can also be a



group, with

(B) at least one alpha-beta olefinically unsaturated compound selected from the group consisting of $C_{2\text{-}40}$ hydrocarbyl nitriles, $C_{2\text{-}40}$ hydrocarbyl carboxylic acids and anhydrides, esters, amides and ammonium and metal salts of said $C_{2\text{-}40}$ carboxylic acids,

the reaction of (A) and (B) resulting in the formation of a carbon-to-carbon bond, said bond including the carbon of at least one



group wherein the ratio of (A) to (B) is between 0.5:1 to about 2:1.

4,186,140

PROCESS FOR THE PRODUCTION OF 3-SUBSTITUTED-2,5-DIOXO-TETRAHYDROFURAN

Piero Pino, Dolderstrasse 94, Zurich, Switzerland, and Denis von Bezard, Vienna, Austria, assignors to Piero Pino, Zurich, Switzerland

Filed Feb. 21, 1978, Ser. No. 879,619

Claims priority, application Switzerland, Feb. 21, 1977, 2115/77

Int. Cl.[2] C07D *307/60*

U.S. Cl. 260—346.74 **17 Claims**

1. Process for the production of 3-substituted-2,5-dioxotetrahydrofuran characterized in that diketene or a substituted diketene is converted in the presence of a catalytic quantity of a carbonyl complex of a metal or carbonyl complexes of metals of the VIIIth group with carbon monoxide and hydrogen at an elevated temperature and an elevated pressure.

4,186,141

PROCESS FOR PREPARING 2-PENTYNYL ETHER

Sigeru Torii; Yuichi Kobayashi, and Hideo Tanaka, all of Okayama, Japan, assignors to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Osaka, Japan

Filed Aug. 9, 1978, Ser. No. 932,311

Claims priority, application Japan, Dec. 28, 1977, 52 6799

Int. Cl.[2] C07D *309/06*; C07C *43/14*

U.S. Cl. 260—345.9 R **4 Claims**

1. A process for preparing 2-pentynyl ether represented by the formula

$$CH_3CH_2C{\equiv}CCH_2OR$$

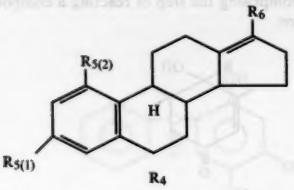
wherein R is tetrahydropyranyl and methoxyethyl characterized by reacting propargyl ether represented by the formula $HC{\equiv}CCH_2OR$ wherein R is as defined above with an ethyl halide in a nonprotonic polar solvent in the presence of a metal hydride selected from the group consisting of sodium hydride, lithium hydride and calcium hydride.

4,186,142
CYCLIZATION SUBSTRATES AND 6α-SUBSTITUTED 19-NORSTEROID DERIVATIVES

Filippus J. Zeelen, Heesch, and Marinus B. Groen, Schayk, both of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Feb. 22, 1978, Ser. No. 880,153
Claims priority, application Netherlands, Feb. 24, 1977, 7701971
Int. Cl.² C07J 0/00
U.S. Cl. 260—397.5 **3 Claims**

1. A compound of the formula:



(VII,VIII)

wherein:

(a) R_4 is halogen, alkoxy of from one to four carbons, and hydrocarbyl of from one to four carbons substituted by one or more (1) halogens or (2) alkoxy moieties of from one to two carbons;

(b) $R_{5(1)}$ and $R_{5(2)}$ are each H, alkyl of one to six carbons, hydroxy, or an esterified or etherified moiety of (1) less than eight carbons selected from the group consisting of alkoxy, trialkylsilyloxy, aralkyloxy, cycloalkoxy, and heterocyclo-oxy radicals; (2) α-alkoxyalkoxy of from two to four carbons, and (3) acyloxy of from one to seven carbons with the proviso that at least one of $R_{5(1)}$ and $R_{5(2)}$ is H; and

(c) R_6 is alkyl of one to four carbons.

4,186,143
CHENODEOXYCHOLIC ACID RECOVERY PROCESS

Peter Ziegler, Toronto; Michael C. Attwell, Islington; Thomas F. Massiah, Agincourt, and Roberto A. Vergottini, Bramalea, all of Canada, assignors to Canada Packers Limited, Toronto, Canada

Continuation of Ser. No. 808,082, Jun. 20, 1977, abandoned, which is a continuation-in-part of Ser. No. 696,425, Jun. 15, 1976, abandoned. This application Aug. 9, 1978, Ser. No. 932,176
Int. Cl.² C07J 9/00
U.S. Cl. 260—397.1 **29 Claims**

1. A process for the isolation and purification of chenodeoxycholic acid from hog bile which comprises the steps of:

(a) saponifying the bile by refluxing the bile in the presence of an aqueous solution of a suitable base;

(b) adjusting the pH of the saponified bile to about pH 8 by adding a mineral acid thereto;

(c) admixing said bile with an essentially water-immiscible solvent having low solubility in said bile and at an acidic pH exerting a preferential solvent action towards the bile acids therein as compared with the remaining constituents of said bile thus forming a two-phase mixture comprising an aqueous and an organic phase and subsequently acidifying said aqueous phase to about pH 5 by adding a diluted mineral acid thereto, separating the organic and aqueous phases and recovering a mixture of bile acids from the organic phase;

(d) esterifying the bile acids by reaction with a suitable alcohol in the presence of a suitable acid catalyst;

(e) neutralizing the reaction mixture thus obtained;

(f) recovering a mixture of bile acid esters from said reaction mixture;

(g) removing substantially all of the hyodeoxycholic acid ester from the remainder of said esterified bile acids by dissolving said mixture of bile acid esters in a suitable solvent comprising a complexing agent selected from the group consisting of benzene and toluene;

(h) treating the solution thus obtained to separate therefrom solid matter having a high content of an adduct of the complexing agent and the hyodeoxycholic acid ester;

(i) recovering from the remaining solution a substantially dry mixture of the remaining bile acid esters;

(j) acetylating the remaining bile acid esters by reacting said mixture with acetic anhydride and a compound selected from the group consisting of sodium acetate and pyridine, and separating from the reaction mixture so obtained a substantially dry mixture of acetylated bile acid esters;

(k) removing substantially all of the acetylated hyocholic acid ester from said mixture of acetylated bile acid esters by dissolving said mixture in a suitable non-polar solvent and treating the solution thus obtained to precipitate therefrom a solid having a high content of acetylated hyocholic acid ester;

(l) treating the remaining solution by evaporation to obtain a residue comprising a substantially dry mixture of the remaining acetylated bile acid esters;

(m) isolating chenodeoxycholic acid ester diacetate from said residue by dissolving said residue in a suitable polar solvent, treating the solution thus obtained to precipitate therefrom a solid having a high content of chenodeoxycholic acid ester diacetate and separating said solid from said remaining solution;

(n) purifying said chenodeoxycholic acid ester diacetate by dissolving said solid in a suitable polar solvent and treating the solution thus obtained to recover therefrom substantially pure, dry chenodeoxycholic acid ester diacetate;

(o) saponifying said chenodeoxycholic acid ester diacetate by refluxing with an aqueous solution of a suitable base;

(p) acidifying the saponified solution to about pH 4.5 by the addition of a mineral acid;

(q) extracting the chenodeoxycholic acid by contacting said saponified and acidified solution with an essentially water-immiscible organic solvent which exerts preferential solvent action toward the chenodeoxycholic acid contained in said saponified and acidified material as compared with said remaining constituents of said saponified and acidified material thus forming a two phase mixture comprising an aqueous phase and an organic phase and separating the resulting organic and aqueous phases;

(r) isolating the chenodeoxycholic acid by treating said organic phase by concentrating and cooling until solid matter containing substantially pure chenodeoxycholic acid is precipitated therefrom, separating the organic phase so treated into a substantially liquid portion and substantially solid portion and treating the substantially solid portion by drying.

4,186,144
PROCESS FOR THE PRODUCTION OF CYANOPINACOLONE

Tsutomu Sugasawa, Kobe; Tatsuo Toyoda, Osaka; Kazuyuki Sasakura, Omihachiman; Shiro Ueda, Osaka; Akira Takase, Kobe; Katsuto Okuno, Matsubara; Ichiro Ishizuka, and Shinzaburo Sumimoto, both of Osaka, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Apr. 17, 1978, Ser. No. 897,001
Claims priority, application Japan, May 10, 1977, 52-53343
Int. Cl.² C07C 121/34
U.S. Cl. 260—465.1 **7 Claims**

1. A process for the production of cyanopinacolone which consists essentially of reacting pinacolone with about 1.0 to about 1.2 molar equivalents of chlorine in methanol and further reacting the resulting monochloropinacolone with about 1.0 to about 1.2 molar equivalents of an alkali metal cyanide in methanol.

4,186,145

PROCESS FOR THE HYDROGENATION OF AN AROMATIC AMINE AND THE SUPPORTED RUTHENIUM CATALYST USED IN THE PROCESS

Oskar Weissel, Krefeld, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 3, 1978, Ser. No. 948,354

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1977, 2745172

Int. Cl.[2] C07C *85/24;* B01J *23/64*

U.S. Cl. 260—563 D 19 Claims

1. A supported ruthenium catalyst comprising ruthenium disposed on a catalyst support comprising a hydroxide, hydrated oxide or oxide of chromium and manganese, said catalyst additionally containing an inorganic and/or organic alkali metal compound.

4,186,146

HYDROGENATION OF AROMATIC NITRILES TO PRIMARY AMINES

Walter A. Butte, Jr., West Chester, and William J. Murtaugh, Eddystone, both of Pa., assignors to Suntech, Inc., Philadelphia, Pa.

Filed Feb. 1, 1979, Ser. No. 8,310

Int. Cl.[2] C07C *85/12*

U.S. Cl. 260—570.5 P 9 Claims

1. In the process of hydrogenating aromatic nitriles to primary amines whereby the nitrile is hydrogenated in a solvent system containing added ammonia using a cobalt or nickel catalyst, the improvement of employing as solvent an ether containing four to six carbon atoms and carrying out the hydrogenation in the presence of water in an amount of from about 10% to about 20% by volume of the ether solvent whereby the rate of reaction is increased, secondary amine by-products are reduced and catalyst may be recycled without adverse effects.

4,186,147

PROCESS FOR PREPARING ANILINE COMPOUNDS

Thomas J. Walter, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 894,132, Apr. 6, 1978, abandoned, which is a continuation-in-part of Ser. No. 823,041, Aug. 9, 1977, abandoned. This application Oct. 19, 1978, Ser. No. 952,812

Int. Cl.[2] C07C *87/28*

U.S. Cl. 260—578 29 Claims

1. In a process for preparing a thioalkyl-aniline by reacting a thiocyano aniline and an alcohol in the presence of an alkali metal cyanide and a dipolar aprotic solvent, the improvement comprising conducting said reaction in the additional presence of an alkyl halide.

4,186,148

PROCESS FOR PRODUCING 3,7-DIMETHYL-2,6-OCTADIENYLAMINE DERIVATIVES

Atsuo Murata; Shuji Tsuchiya; Akihiro Konno, and Jun Uchida, all of Funabashi, Japan, assignors to Nissan Chemical Industries Limited, Tokyo, Japan

Filed May 3, 1978, Ser. No. 902,758

Claims priority, application Japan, May 11, 1977, 52-54045

Int. Cl.[2] C07C *85/18;* C07D *295/02*

U.S. Cl. 260—583 H 13 Claims

1. A process for producing a 3,7-dimethyl-2,6-octadienylamine compound comprising: reacting isoprene with a secondary amine in the presence of a catalyst prepared by reacting a secondary amine, a conjugated diene and/or a polycyclic aromatic compound, a lithium salt and sodium and/or potassium metal.

4,186,149

PROCESSES FOR PREPARING CYCLOHEXADIENE DERIVATIVES

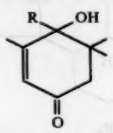
Kenneth K. Light, Long Branch; Bette M. Spencer, Ocean Grove; Joaquin F. Vinals, Red Bank, all of N.J.; Jacob Kiwala, Brooklyn, N.Y.; Manfred H. Vock, Locust, N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 860,121, Dec. 13, 1977, Pat. No. 4,154,763, which is a division of Ser. No. 774,058, Mar. 3, 1977, Pat. No. 4,076,854. This application Feb. 2, 1979, Ser. No. 8,779

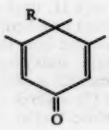
Int. Cl.[2] C07C *45/00*

U.S. Cl. 260—586 R 3 Claims

1. The process comprising the step of reacting a compound having the structure:



with a mineral acid selected from the group consisting of dilute aqueous hydrochloric acid, dilute aqueous sulfuric acid or dilute aqueous phosphoric acid thereby forming a compound having the structure:



wherein R is C_1–C_5 alkyl.

4,186,150

NOVEL OXYHYDROCARBYLNORBORNANE DERIVATIVES AND PERFUMERY USES THEREOF

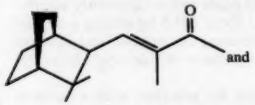
Kenneth K. Light, Highlands; James M. Sanders, Eatontown; Manfred H. Vock, Locust, all of N.J.; Edward J. Shuster, Brooklyn, N.Y.; Joaquin Vinals, Red Bank, N.J.; William L. Schreiber, Jackson, N.J.; John B. Hall, Rumson, N.J.; Denis E. Hruza, Sr., Bricktown, N.J.; Venkatesh Kamath, Red Bank, N.J.; Braja D. Mookherjee, Holmdel, N.J.; Ching Y. Tseng, Middletown, N.J., and Mark A. Sprecker, Sea Bright, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

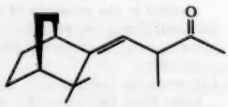
Continuation-in-part of Ser. No. 765,847, Feb. 4, 1977, Pat. No. 4,076,853. This application Dec. 13, 1977, Ser. No. 860,124

Int. Cl.[2] C07C *49/61*

U.S. Cl. 260—586 G 1 Claim

1. A mixture of oxyhydrocarbylnorbornane derivatives having the structures:



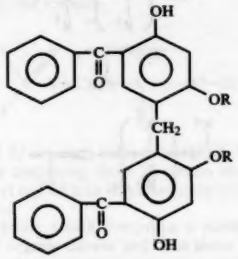


4,186,151
PROCESS FOR PREPARING A 5,5'-METHYLENEBIS(2-HYDROXY-4-ALKOXYBENZOPHENONE)

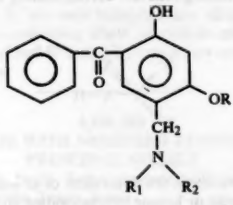
Naohiro Kubota; Toshihiro Shibata, both of Urawa, and Kazuo Sugibuchi, Tokyo, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Feb. 22, 1978, Ser. No. 880,295
Int. Cl.[2] C07C *45/00*
U.S. Cl. 260—591 5 Claims

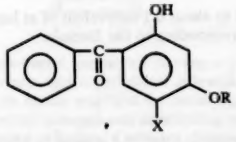
1. A process for preparing 5,5'-methylene bis(2-hydroxy-4-alkoxybenzophenone) represented by the formula:



in which R is an alkyl group having 1 to 12 carbon atoms, comprising the steps of treating a 2-hydroxy-4-alkoxy-5-aminomethylbenzophenone represented by the formula



in which R is an alkyl group having 1 to 12 carbon atoms, and R_1 and R_2 taken together form a 5 to 6 member heterocyclic ring free of carbonyl substituents and including the nitrogen atom, or are independently hydrogen atoms or alkyl groups having 1 to 6 carbon atoms, provided that R_1 and R_2 are not simultaneously hydrogen, with a 2-hydroxy-4-alkoxybenzophenone represented by the formula



in which R is an alkyl group having 1 to 12 carbon atoms and X is hydrogen or $—CH_2NR_1R_2$ in the presence of alkali and an organic solvent, removing the solvent, and recovering the 5,5'-methylenebis-(2-hydroxy-4-alkoxybenzophenone).

4,186,152
OXIDATION OF OLEFINS

Haruhisa Yamamoto, and Shinichi Akiyama, both of Takaoka, Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Aug. 2, 1977, Ser. No. 821,315
Claims priority, application Japan, Aug. 6, 1976, 51-93661
Int. Cl.[2] C07C *45/04*
U.S. Cl. 260—604 R 4 Claims

1. In a process comprising the production of an unsaturated aldehyde by oxidizing propylene or isobutylene in the vapor phase at a temperature of 250° to 700° C. in the presence of a catalyst to the corresponding unsaturated aldehyde, the improvement wherein the catalyst for the said oxidation has a composition of the formula

$$Mo_aBi_bFe_cCo_dNi_eBe_fQ_gR_hX_iO_j$$

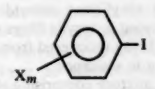
wherein Q is at least one element selected from K, Rb, Cs and Tl; R is at least one element selected from P, As and B; X is at least one element selected from Ce, Ti, Te, Zn, Ge, Sn, Cr, Ga, La, In, Al, Cd, Pd, Mn, V, Pd, Nb, Ag, Zr, Cu, Nd and U; a, b, c, d, e, f, g, h and i respectively represent the numbers of Mo, Bi, Fe, Co, Ni, Be, Q, R and X atoms, and when a is taken as 12, b is 0.1–10, c is 0.5–40, d is 0–12, e is 0–12 with the proviso that the sum of d and e is 0.5–15, f is 0.1–35, g is 0.01–5, h is 0–5, i is 0–12; and j is the number of oxygen atoms which satisfies the atomic valences of the other elements.

4,186,153
PROCESS FOR 1,2,4,5-TETRACHLOROBENZENE

Irwin W. Potts, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 16, 1978, Ser. No. 869,562
Int. Cl.[2] C07C *25/00*
U.S. Cl. 260—650 R 9 Claims

1. In the process of preparing 1,2,4,5-tetrachlorobenzene, the process comprising contacting at reactive conditions 1,2,4-trichlorobenzene and chlorine gas in the presence of a catalytic amount of Lewis acid, the improvement comprising using as a cocatalyst at least one iodoaryl compound of the formula



wherein X is a substituent which has less affinity for electrons than does hydrogen, and m is an integer of 0–3.

4,186,154
POLYCARBONATE MIXTURES WHICH CAN BE PROCESSED AS THERMOPLASTICS

Rudolf Binsack, Krefeld; Eckart Reese, Dormagen; Erhard Tresper, Krefeld, and Joachim Wank, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen

Filed Jun. 19, 1978, Ser. No. 916,636
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1977, 2729763
Int. Cl.[2] C08L *67/00*
U.S. Cl. 525—461 11 Claims

1. A halogen-free polycarbonate mixture consisting essentially of (A) from about 15 to 50% by weight of an aromatic polycarbonate having a weight average molecular weight (Mw) of from about 70,000 to 120,000 and (B) from about 85 to 50% by weight of an aromatic polycarbonate having a weight average molecular weight (Mw) of from about 29,000 to 39,000, said aromatic polycarbonates being selected from a group consisting of homopolycarbonates obtained from bisphenol A and copolycarbonates obtained from at least about 80 mol % of bisphenol A and up to about 20 mol % of other

halogen-free diphenols, based on the total molar amount of diphenols.

4,186,155

METHOD FOR THE MANUFACTURE OF GRAFT COPOLYMERS

Jacques Delsarte, Villers Saint Sepulcre, France, assignor to Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Jun. 21, 1978, Ser. No. 917,418
Claims priority, application France, Jul. 12, 1977, 77 21435
Int. Cl.[2] C08F *279/02, 279/04*
U.S. Cl. 525—78 **14 Claims**

1. The method of making graft copolymers by the polymerization of a monomeric mixture comprising at least one aromatic vinyl compound and at least one acrylic or methacrylic compound in the presence of a graftable monodimensional elastomer latex containing ethylenic double bonds, comprising the steps of first carrying out the polymerization under aqueous emulsion polymerization conditions in the presence of an initial amount of a first graftable monodimensional elastomer latex containing ethylenic double bonds that is a major portion of the latex entering into the composition of the graft copolymer until the xy/z ratio is greater than 30%; x being the total parts by weight of said monomers, y the conversion coefficient of said monomers expressed in percent of total amount, and z the total amount of elastomer expressed in parts by weight of dry solids, and thereafter adding the remaining amount of a second graftable monodimensional elastomer latex containing ethylenic double bonds and completing the polymerization reaction under suspension polymerization conditions, said first and second latexes being the same or different.

4,186,156

CRYSTALLIZABLE VINYLIDENE CHLORIDE POLYMER POWDERS AND ACRYLIC FIBERS CONTAINING SAME

Dale S. Gibbs, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 15, 1978, Ser. No. 942,513
Int. Cl.[2] C08L *33/20*
U.S. Cl. 529—78 **13 Claims**

1. A crystallizable vinylidene chloride polymer powder which can be incorporated in acrylic fibers as a flame-retardant additive, said powder being recovered from a latex obtained by emulsion polymerizing in sequence

(a) a first monomer mixture comprising about 85 to about 95 weight percent vinylidene chloride and about 5 to about 15 weight percent of a copolymerizable ethylenically unsaturated comonomer;

(b) a minor amount of a polyfunctional comonomer for providing graft sites on the product of (a); and

(c) about 10 to about 25 weight percent, based on the weight of the first monomer mixture, of a second monomer mixture comprising about 85 to about 95 weight percent acrylonitrile and about 5 to about 15 weight percent of a copolymerizable ethylenically unsaturated comonomer;

wherein the particles in the resulting latex have a diameter less than about 1 micron.

4,186,157

PHOSPHORUS-CONTAINING REACTION MIXTURE

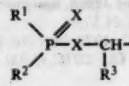
David E. Rippie, Kirtland, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Division of Ser. No. 781,249, Mar. 25, 1977, Pat. No. 4,081,387.
This application Jan. 30, 1978, Ser. No. 873,298
The portion of the term of this patent subsequent to Mar. 28, 1995, has been disclaimed.
Int. Cl.[2] C07F *9/165;* **C10M** *1/48*
U.S. Cl. 260—948 **17 Claims**

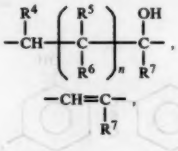
1. A process for the preparation of a phosphorus-containing reaction mixture, said mixture comprising at least one additive corresponding to the formula:

$$Y^a\text{-}S\text{-}Y^b$$

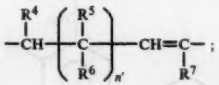
wherein Y^a corresponds to



and Z is



or



Y^b is

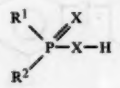
$$\text{-}R^8\text{-}S\text{-}R^9$$

or

$$\text{-}R^8\text{-}H$$

which process comprises the steps of reacting

(A) about 0.1 to about 1.0 equivalents of at least one phosphorus-containing reactant corresponding to the formula:



with

(B) about 1.2 to about 0.1 equivalent of at least one unsaturated aldehyde or ketone corresponding to the formula:

wherein the reaction of (A) and (B) is carried out at a temperature in the range of about 10° C. up to the decomposition point of any component of the reaction mixture and the further reaction of (A) and (B)

with

(C) about 1.2 to about 0.1 equivalent of at least one thiol or dithiol corresponding to the formula:

$$HS\text{-}R^8\text{-}H$$

or

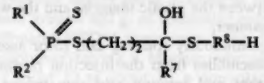
$$HS\text{-}R^8\text{-}SH$$

wherein the reaction of (A) and (B) with (C) is carried out in the presence of an acid catalyst to prepare the unsaturated phosphorus-containing reaction mixture at a temperature in the range of about 0° C. to about 100° C. wherein each R^1 and R^2

is independently a member selected from the group consisting of hydrocarbyl, hydrocarbyloxy and hydrocarbylmercapto of one to about 30 carbon atoms; R^3 is hydrogen or hydrocarbyl of up to about 10 carbon atoms; R^4 is hydrogen or lower alkyl; R^5 and R^6 are each independently selected from hydrogen, hydrocarbyl, hydrocarbyloxy and hydrocarbylmercapto of one to about 10 carbon atoms; R^7 is hydrogen or hydrocarbyl of one to about 30 carbon atoms; R^8 is a divalent hydrocarbyl group of one to about 30 carbon atoms; R^9 is hydrogen or Y^a; each X is independently oxygen or divalent sulfur; n is zero or an integer of one to about 10 and n' is zero or an integer of one to about 9.

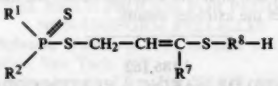
2. The phosphorus-containing reaction mixture produced by the process of claim 1.

16. A concentrate which comprises a substantially inert, normally liquid organic diluent and from about 10% to about 90% of the phosphorus-containing reaction mixture of claim 2 corresponding to the formula:



wherein R^1 and R^2 are each independently alkyloxy or alkylphenoxy groups containing about 18 carbon atoms, R^7 is hydrogen or methyl and R^8 is an alkylene group containing about 12 carbon atoms.

17. A concentrate which comprises a substantially inert, normally liquid organic diluent and from about 10% to about 90% of the phosphorus-containing reaction mixture of claim 2 corresponding to the formula:



wherein R^1 and R^2 are each independently alkyloxy or alkylphenoxy groups containing about 18 carbon atoms, R^7 is hydrogen or methyl and R^8 is an alkylene group containing about 12 carbon atoms.

4,186,158

CARBURETOR WITH MODIFIED VENTURI FOR ITS PRINCIPAL NOZZLE

Minoru Yamada, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Feb. 27, 1978, Ser. No. 881,789
Claims priority, application Japan, Apr. 14, 1977, 52-45735
Int. Cl.² F02M *19/08*
U.S. Cl. 261—23 A **5 Claims**

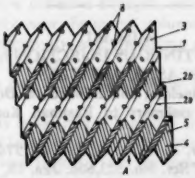
1. In a multiple-barrel carburetor having a primary intake passage with an axis and a peripheral sidewall, a secondary intake passage, an intake manifold for receiving fuel-air mixture from said intake passages and distributing said mixture to a plurality of engine cylinders, a primary throttle valve in said primary intake passage, a secondary throttle in said secondary intake passage, both of said throttle valves being upstream from said intake manifold, a tubular venturi member upstream from said primary throttle valve in said primary intake passage and having an outer wall spaced from the sidewall of the primary intake passage, an upstream edge, a downstream edge, and a venturi passage extending between said upstream and downstream edges axially aligned with said axis of the primary intake passage, and a main nozzle passing through said wall of the venturi member and discharging into said venturi passage, said main nozzle having an opening end located in said venturi passage, the improvement comprising: said downstream edge lying in a plane inclined relative to the axis of said primary intake passage, and having its farthest-upstream point adjacent to said main nozzle.

4,186,159

PACKING ELEMENT OF FOIL-LIKE MATERIAL FOR AN EXCHANGE COLUMN

Max Huber, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Oct. 26, 1977, Ser. No. 845,785
Claims priority, application Switzerland, May 12, 1977, 5949/77
Int. Cl.² B01F *3/04*
U.S. Cl. 261—112 **8 Claims**



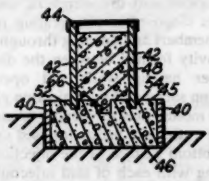
1. A packing element for an exchange column comprising a plurality of vertically disposed corrugated plates of foil-like material each having a longitudinal axis disposed in contacting parallel relation and parallel to said axis, each plate having corrugations disposed at an angle to the corrugations of an adjacent plate, each said plate forming a surface for receiving a descending flow of liquid thereon, said surface being sub-divided perpendicularly of said axis to have alternating smooth portions extending transverse to said corrugations and finely-fluted portions extending transverse to said corrugations, said finely-fluted portions being laterally disposed to laterally distribute the liquid under capillary action.

4,186,160

METHOD AND APPARATUS FOR FORMING BUILDING FOUNDATIONS

George H. Landreth, 180 E. Jersey St., Gladstone, Oreg. 97027

Division of Ser. No. 760,753, Jan. 19, 1977. This application Nov. 20, 1978, Ser. No. 962,093
Int. Cl.² E04B *1/54*
U.S. Cl. 264—34 **1 Claim**



1. A process for forming a perimeter-type building founda-

tion comprising a footing and wall atop said footing from a hardenable plastic material, said process comprising:

(a) mounting a first elongate form having the general shape of said footing upon a working surface;

(b) pouring a first predetermined amount of said plastic material into said first form so as to form said footing;

(c) forming a pair of parallel, elongate, transversely spaced grooves and an intermediate elongate keyway parallel to and equidistant from said pair of grooves longitudinally in a top surface of said footing while said plastic material is in said plastic state;

(d) thereafter allowing said plastic material to harden;

(e) thereafter mounting a second elongate form having the general shape of said wall and comprising a pair of opposed upright sidewalls upon said top surface of said footing so that the interior of said second form is exposed to said keyway and inserting a lower part of each of said sidewalls into a respective one of said pair of grooves so as to obtain lateral anchoring support from said grooves;

(f) pouring a second predetermined amount of said plastic material into said second form and into said keyway so as to form said wall and a key integral to said wall; and

(g) allowing said second amount of plastic material to harden.

4,186,161

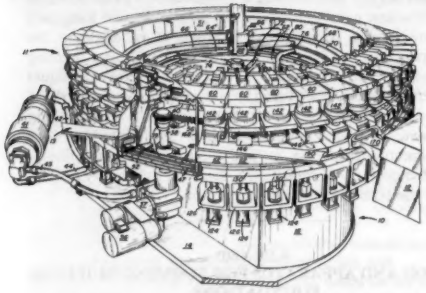
METHOD OF CONTINUOUS INJECTION MOLDING OF PLASTIC ARTICLES

Lawrence A. Ulmschneider, and Edward H. Dowling, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 430,858, Jan. 4, 1974, abandoned, which is a division of Ser. No. 323,606, Jan. 15, 1973, Pat. No. 3,833,329, which is a continuation of Ser. No. 86,668, Nov. 4, 1970, abandoned. This application Jul. 14, 1975, Ser. No. 595,653

Int. Cl.[2] B29F *1/00*

U.S. Cl. 264—37 **8 Claims**



1. In a continuous plastic injection molding apparatus comprising a rotor assembly mounted for rotary motion about a base member, said rotor assembly having a plurality of mold assemblies mounted thereon, each mold assembly having a pair of separable mating die members with means arranged to selectively open and close said die members, means forming an injection chamber disposed in cooperating relationship with each pair of die members and opening through a sprue opening into the mold cavity formed between the die members, said injection chamber having walls and opening outwardly through the bottom surface of said injection chamber-forming means, stationary molten plastic extruder means having at least one inlet and one outlet and being disposed contiguous to the opening in the bottom surface of the injection chamber, ram means cooperating with each of said injection chambers and arranged for vertical movement into and out of each of said injection chambers, and actuating means operable in response to the position of a mold assembly about the periphery of said base member to cause said mold assembly to be closed and the upper end of said ram means to be spaced from the bottom surface of the injection chamber-forming means before the mold assembly reaches said extruder means and, after passing said extruder means, to cause said ram means to be driven upwardly into said injection chamber to force molten plastic therein into said mold cavity, the method of injection molding plastic articles comprising the steps of:

substantially continuously rotating said rotor assembly and said mold assemblies past said extruder means,

continuously supplying molten plastic material from said stationary extruder means directly into the bottom opening of the injection chamber of a mold assembly as it is continuously moved past said extruder,

rotating said rotor assembly and said mold assemblies from said extruder means to the position where said actuating means causes said ram means to be driven into said injection chamber, said plastic material being retained in said injection chamber during rotation to said position by adhesion between the plastic material and the walls of the injection chamber,

substantially continuously rotating said rotor assembly and said mold assemblies from the injection position to said extruder means and moving said ram means into said injection chamber during said rotation to inject the plastic material in said injection chamber into said mold cavity,

opening each of said mold assemblies after the plastic material therein has solidified to form the article, removing the solidified article therefrom, and closing the mold assembly before the mold assembly reaches the extruder means, and

after solidification of the plastic material in said mold assembly, withdrawing said ram means from said injection chamber and spacing said ram means from the bottom opening of said injection chamber before the mold assembly reaches the extruder means.

4,186,162

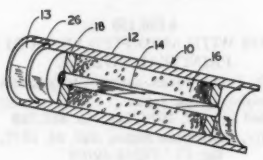
METHOD OF MAKING A PLATEN CORE

Thomas G. Daley, 9716 Lanesboro Way, Louisville, Ky. 40222

Filed Apr. 14, 1978, Ser. No. 896,577

Int. Cl.[2] B29D *27/04*

U.S. Cl. 264—46.5 **5 Claims**



1. A method for making a business machine platen core including the steps of:

(a) inserting one end of an elongated rod into a centrally disposed opening of a first collar;

(b) placing a tubular member onto said rod;

(c) inserting said first collar, rod, and tubular member into one end of a cylindrical housing having openings in each end thereof;

(d) inserting a first plug into said one end forcing said collar a preselected distance into said cylindrical member;

(e) adding a foamable thermosetting resin reaction mixture to said cylindrical member, said mixture being added between the outer walls of said tubular member and the inner walls of said cylindrical member;

(f) adding a second collar having a centrally disposed opening therein to the opposite end of said cylindrical member, said opening in said second collar receiving the opposite end of said elongated rod;

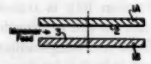
(g) inserting a second plug into said opposite end of said

cylindrical member forcing said collar a preselected distace into said cylindrical member;
(h) foaming and curing said mixture; and ,
(i) removing said plugs and rod from said cylindrical member.

4,186,163
METHOD OF MANUFACTURING THERMOPLASTIC IONOM FOAM PRODUCTS
Douglas Brenner, Livingston, and Robert D. Lundberg, Somerville, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.
Filed Oct. 4, 1977, Ser. No. 839,172
Int. Cl.[2] B29D *27/00*
U.S. Cl. 264—54 **8 Claims**

1. A process for forming an elastomeric composition, said composition consisting essentially of a neutralized sulfonated EPDM terpolymer having about 10 to about 100 meq. neutralized sulfonate groups/100 g. of sulfonated polymer, said neutralized sulfonated EPDM terpolymer being derived from an EPDM terpolymer having a Mooney viscosity (M.L. 1+8, 212° F.) of about 10 to about 10, a nonvolatile preferential, polar plasticizer, said nonvolatile polar preferential plasticizer plasticizing said neutralized sulfonate groups, an oil, a filler, and a chemical foaming agent which consists essentially of the step of extruding said composition at a temperature of at least about 150° C., said composition foaming into an article upon exiting from said extruder.

4,186,164
PLURAL MOLD PROCESS FOR PRODUCING NON-UNIFORM PELLICLES
Mark A. Spivack, Watchung, N.J., assignor to Union Carbide Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 272,419, Jul. 17, 1972, abandoned. This application Nov. 12, 1975, Ser. No. 631,301
Int. Cl.[2] B29D *7/00*
U.S. Cl. 264—81 **16 Claims**

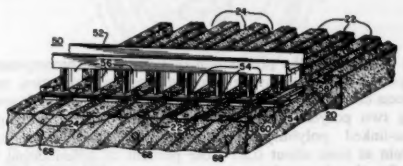


1. A process for producing pellicles of non-uniform thickness between a plurality of mold plates, each of said mold plates in a zone for condensing vapors of p-xylylene monomer under vacuum forming conditions,
each of said mold plates being mounted for selectable rotational movement about an axis which runs through its mold surface and is fixed within said zone,
which comprises,
positioning said mold plates with respect to each other so that at least two of said mold surfaces form a passage between their surfaces which face each other,
providing a pattern of non-uniform pressure within said passage,
directing a stream of vapors of p-xylylene monomer through said passage between the passage-forming mold surfaces, and
causing said monomer to condense and polymerize on at least one of said passage-forming surfaces in response to said pattern of pressure, so as to thereby provide on at least one of said passage-forming surfaces a pellicle of non-uniform thickness, the pattern of said non-uniform thickness in said pellicles being directly proportional to the pattern of said pressure.

4,186,165
METHOD OF PRODUCING AN ABSORBENT PANEL HAVING DENSIFIED PORTION WITH HYDROCOLLOID MATERIAL FIXED THEREIN
Gerhard M. Aberson, Downers Grove, and Emily M. Stulgate, Oak Park, both of Ill., assignors to Johnson & Johnson, New Brunswick, N.J.
Division of Ser. No. 695,683, Jun. 14, 1976, Pat. No. 4,103,062. This application Jan. 5, 1978, Ser. No. 867,062
Int. Cl.[2] D04H *1/64*
U.S. Cl. 264—112 **14 Claims**

1. A method of producing an absorbent component for use in an absorbent product which comprises:
providing an air-laid, cellulosic fibrous batt in which the cellulosic fibers constitute at least 50% of the batt having relatively low cohesive strength, relatively low capillarity, relatively poor shape and volume stability, relatively low fluid retentivity, and containing moisture distributed throughout the batt;
distributing a particulate hydrocolloid material within said batt,
simultaneously subjecting at least one surface of said batt to an elevated temperature sufficient to cause a migration of moisture away from surface, but below the boiling temperature of water, while compressing said batt at a pressure of at least about 2 kg./cm.[2] to form in said batt an integral, densified, compacted, porous, absorbent fibrous region, said region having relatively high cohesive strength, relatively good capillarity, relatively good shape and volume stability, and relatively high fluid retentivity, and fixing a substantial portion of said distributed hydrocolloid material in said batt.

4,186,166
METHOD FOR PRODUCING CONCRETE PANEL HAVING FRACTURED RIB FINISH
Henry D. Hight, Jr., Fort Worth, Tex., assignor to Martin Concrete Engineering Company, Fort Worth, Tex.
Division of Ser. No. 785,067, Apr. 6, 1977, Pat. No. 4,088,112, which is a continuation-in-part of Ser. No. 722,586, Sep. 13, 1976, abandoned. This application Jan. 23, 1978, Ser. No. 871,744
Int. Cl.[2] B28D *1/26*; B28B *1/29*
U.S. Cl. 264—139 **2 Claims**



1. A method for producing a concrete panel having a fractured rib finish comprising:
(a) casting a quantity of relatively low slump concrete mixture on a pallet in the form of a panel;
(b) extruding the casting to define projecting ribs and channels between the ribs extending in a parallel pattern along the length of the panel;

(c) permitting the casting to harden until the concrete becomes rigid but not completely set; and,

(d) applying a shearing force against each rib by drawing an array of wedges through the channels along the length of the rigid but not completely set casting with each wedge disposed in shearing engagement with edge portions of adjacent ribs.

4,186,167

GRANULAR FLOCCULANTS AND THEIR MANUFACTURE

Wataru Agui, Tokyo; Nobuyuki Higosaki, Kiyose; Koichiro Yamanari, Tokyo; Toshio Furukawa, Tokyo, and Hiroshi Kuyama, Urawa, all of Japan, assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 872,963, Jan. 27, 1978. This application Oct. 20, 1978, Ser. No. 953,136

Claims priority, application Japan, Jan. 31, 1977, 52/8801

Int. Cl.² B01J *2/20*

U.S. Cl. 264—141 **7 Claims**

1. A process for making a granular flocculant which comprises: (a) mixing one part by weight of high-molecular-weight, polyvinylimidazoline flocculant with from about 0.05 to about 1.0 part of water-insoluble, siliceous binder, (b) kneading one part by weight of the resulting mixture with from about 0.4 to about 1.0 part by weight of an organic solvent in which the flocculant is substantially insoluble, (c) pelletizing the resulting mass, and (d) drying the pellets.

4,186,168

PROCESS FOR PRODUCING BICOMPONENT FILAMENTS WITH SPECIAL CROSS-SECTION

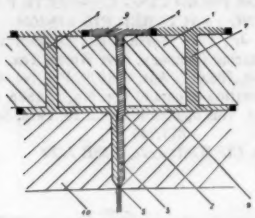
Gerard Barbe, Craponne, and Robert Habault, Lyons, both of France, assignors to Rhone-Poulenc-Textile, Paris, France

Division of Ser. No. 707,242, Jul. 21, 1976, Pat. No. 4,117,194, which is a continuation-in-part of Ser. No. 559,421, Mar. 18, 1975, Pat. No. 3,973,073, which is a continuation of Ser. No. 356,576, May 2, 1973, abandoned. This application Dec. 7, 1977, Ser. No. 858,178

Claims priority, application France, May 4, 1972, 72.16921; Feb. 27, 1976, 76 05791

Int. Cl.² D02G *3/00*; **D01D** *5/20*

U.S. Cl. 264—168 **10 Claims**



1. Process for the production of side-by-side bicomponent polyester filaments having improved crimp properties, said process comprising simultaneously and side-by-side melt spinning two polyester polymers by passing melted sparingly cross-linked polybutylene terephthalate polymer having therein at least about 0.20 mole percent of trifunctional or tetrafunctional ester-forming cross-linking agent and having a melted state viscosity VF of at least about 2000 poises at 260° C. through a plurality of channels in a distribution plate of a spinneret assembly into, in the form of jets or streams, a cavity between said distribution plate and the spinneret plate of said assembly, separately introducing melted polyethylene terephthalate polymer into said cavity to surround and envelope said jets or streams of polybutylene terephthalate, and thereafter passing the jets of polybutylene terephthalate and associated polyethylene terephthalate through a plurality of bores in said spinneret plate of said spinneret assembly, said bores of larger diameter than said channels, each bore associated with a corresponding channel, the axis of each bore displaced from the axis of each channel at least the distance equal to the differences between the radiuses of said bore and said channel to produce side-by-side polyester filaments wherein the polyethylene terephthalate partly envelopes the polybutylene terephthalate, wherein at least 45% of the periphery of the polybutylene terephthalate is covered by said polyethylene terephthalate.

4,186,169

PROCESS AND APPARATUS FOR CONTINUOUSLY PRESTRESSING CONCRETE PRODUCTS

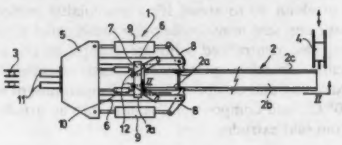
Alister Black, Blenheim, New Zealand, assignor to Universal Development Company Limited, Blenheim, New Zealand

Filed Oct. 19, 1977, Ser. No. 843,622

Claims priority, application New Zealand, Oct. 21, 1976, 182391

Int. Cl.² B28B *21/60*

U.S. Cl. 264—228 **3 Claims**



1. A method of prestressing reinforcing tendons in concrete products manufactured in separable moulds in a production line where the reinforcing tendons are continuous, comprising the steps of prestressing the tendons within a first product mould, moulding a product in the first product mould, introducing a subsequent mould in series with the first mould, and prestressing the reinforcing tendons between at least one point at the head of the production line and the previously moulded product in which stress transfer between the reinforcing and the product has taken place, wherein said at least one point at the head of the production line is transfered from a static primary anchoring means on the production line to a secondary anchoring means fixed to a longitudinally movable device which advances the moulds in the production line wherein said subsequent mould is introduced between the previously molded product and the secondary anchoring means.

4,186,170

METHOD OF PRODUCING A MOLDED PLASTIC ARTICLE

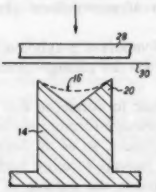
Roy B. Parsons, Leicester, England, assignor to Engraving Specialists (Leicester) Ltd., Leicester, England

Filed Apr. 5, 1977, Ser. No. 784,944

Claims priority, application United Kingdom, Apr. 10, 1976, 14734/76

Int. Cl.² B29C *9/00*

U.S. Cl. 264—247 **4 Claims**



1. A method of producing an integrally molded thermoplas-

tic pinboard for handicrafts having a plurality of headed shanks extending therefrom comprising the steps of:

(a) forming a base having a plurality of shank members extending outwardly from one side thereof, each said shank having a head with a conical recess and an annular lip;

(b) placing a flat, smooth siliconized rubbery surface which is part of a heated platen on the annular lip of each of said plurality of shanks; and

(c) deforming said annular lip on each said shank radially outward thereby forming a rounded, circular head on each said shank.

2. A method of producing an integrally molded thermoplastic pinboard for handicrafts having a plurality of uniformly sized and shaped headed shanks extending therefrom comprising the steps of:

(a) forming a base having a plurality of shank members extending outwardly from one side thereof, each said shank having a head with a conical recess and an annular lip;

(b) placing the flat, smooth surface of a heated platen on the annular lip of each of said plurality of shanks; and

(c) deforming said annular lip on each said shank radially outward thereby forming a flat, circular head on each said shank.

4,186,171

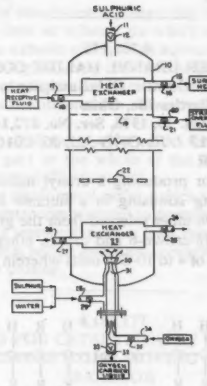
APPARATUS FOR THE WET OXIDATION OF SULPHUR AND THE CAPTURE OF GENERATED HEAT

Xerxes T. Stoddard, 4617 W. 27th Ave., Denver, Colo. 80212; Vasper A. Vaseen, 9840 W. 35th Ave., Wheatridge, Colo. 80033, and Ruel C. Terry, 3090 S. High St., Denver, Colo. 80210

Division of Ser. No. 832,635, Sep. 12, 1977, which is a continuation-in-part of Ser. No. 658,512, Feb. 17, 1976, abandoned. This application Apr. 17, 1978, Ser. No. 896,802

Int. Cl.[2] B01J *8/04;* C01B *17/80*

U.S. Cl. 422—161 **3 Claims**



1. A reactor suitable for manufacture of sulphuric acid by wet oxidation of sulphur in the presence of water, comprising in combination

a first generally cylindrical side wall defining a chamber composed of said cylindrical side wall, a top wall and a bottom wall,

a first fluid injection means into said chamber, the first fluid injection means being positioned in the said bottom wall, and the said first fluid injection means containing a venturi at its extremity within the said chamber,

a mixture of sulphur and water source means connected to and communicating with said first fluid injection means for delivering the mixture of sulphur and water to said chamber,

a second fluid injection means into said chamber, the second fluid injection means containing a nozzle at its extremity within the said chamber, the said nozzle being concentrically disposed with and positioned within the said venturi of the said first fluid injection means,

oxygen carrier liquid source means connected to and communicating with said second fluid injection means for delivering oxygen carrier liquid to said chamber,

a third fluid injection means into said chamber, the third fluid injection means containing a nozzle at its extremity, the nozzle being concentrically disposed with respect to the said nozzle of the said second fluid injection means,

oxygen source means connecting to and communicating with the said third fluid injection means for delivering oxygen to the said chamber,

a first fluid withdrawal means, the first fluid withdrawal means being positioned in the said top wall,

sulphuric acid withdrawal means connected to and communicating with said first fluid withdrawal means for removing sulphuric acid from said chamber,

a second fluid withdrawal means, the second fluid withdrawal means being positioned in the said cylindrical side wall,

stripped carrier liquid withdrawal means connected to and communicating with said second fluid withdrawal means for removing stripped carrier liquid from said chamber, and

a plurality of serially disposed catalyst trays containing a catalyst thereon, the said catalyst trays being positioned within the said chamber.

4,186,172

MONOLITHIC CATALYTIC MUFFLER HAVING NONDEPOSIT WELDS

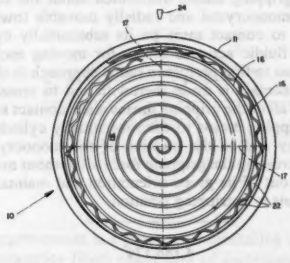
Rainer Scholz, Ingolstadt, Fed. Rep. of Germany, assignor to Audi Nsu Auto Union Aktiengesellschaft, Neckarsulm, Fed. Rep. of Germany

Filed May 5, 1978, Ser. No. 903,059

Claims priority, application Fed. Rep. of Germany, May 6, 1977, 2720322; Jun. 22, 1977, 2727967

Int. Cl.[2] B21D *53/00, 53/02;* F01N *3/15*

U.S. Cl. 422—180 **13 Claims**



1. A catalytic muffler comprising:

a first metal foil;

a second metal foil wrapped with said first foil and forming therewith a plurality of throughgoing gas passages, said foils contacting each other at a multiplicity of locations, at least one of said foils being catalytically active;

nondeposit welds between said foils at a plurality of said locations uniting said foils into a monolithic and rigid insert;

a housing snugly surrounding and contacting said insert; and

nondeposit welds between said housing and said insert fixing same rigidly together.

4,186,173
APPARATUS FOR PRODUCING MONOCRYSTALS

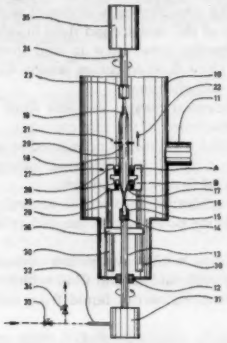
Karl Jericho, Hanau; Joachim Floymayr, Hanau am Main; Uwe Reimpell, and Dieter Drechsel, both of Bruchköbel, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH & Co. KG, Cologne, Fed. Rep. of Germany

Division of Ser. No. 676,187, Apr. 12, 1976, Pat. No. 4,078,897. This application Sep. 12, 1977, Ser. No. 832,757

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1975, 2515850

Int. Cl.[2] B01J *17/10*

U.S. Cl. 422—250 5 Claims



1. Apparatus for producing monocrystals by crucible free zone melting, wherein the molten zone moves upwardly along a rod from which the monocrystal is produced and wherein the monocrystal includes a seed crystal, a neck portion continuing therefrom, a conical transitional zone and a substantially cylindrical main part, said apparatus including a chamber for the formation of a protective atmosphere, heating means for the production of melting heat for the molten zone, driving means for the mechanical movements necessary for the crystal formation, mounting means for the seed crystal, and supporting means which is applicable to the monocrystal beyond the conical portion and below the molten zone for supporting the monocrystal in the given orientation thereof comprising a plurality of gripping means distributed about the circumference of the monocrystal and radially movable towards said monocrystal to contact same on its substantially cylindrical surface, and fluidic actuator means for moving each of said gripping means to first perform a radial approach to the monocrystal until contact is made therewith and to remain in this position until all of the gripping means make contact to thereby adapt the gripping means to the substantially cylindrical surface geometry and to the position of the monocrystal, and thereafter increasing the gripping force all without moving the monocrystal out of its given orientation and maintaining the gripping means in a gripping position.

4,186,174
PROCESS AND APPARATUS FOR OBTAINING A MORE CONCENTRATED SOLUTION OF A COMPONENT USING ION EXCHANGE BEDS

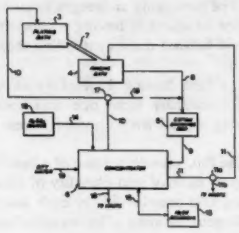
Robert F. Hunter, Burlington, and Irving H. Spinner, Etobicoke, both of Canada, assignors to Eco Tec Limited, Toronto, Canada

Continuation of Ser. No. 637,605, Dec. 4, 1975, which is a continuation of Ser. No. 249,857, May 3, 1972, abandoned. This application Sep. 13, 1977, Ser. No. 832,861

Int. Cl.[2] C01G *37/12*

U.S. Cl. 423—54 5 Claims

1. A process for removing chromium containing anions from used rinse water from a chrome treatment operation and producing a concentrated solution of chromic acid, in which the used rinse water is passed through a cation exchange bed to remove cation impurities and then through an anion exchange bed in hydroxyl form from the top to remove chromium containing anions, a concentrated aqueous alkali metal hydroxide solution is then passed from a reservoir through said anion exchange bed from the bottom to produce a concentrated solution of chromium containing anions at the top of said anion exchange bed, said concentrated solution of chromium containing anions is then passed directly to and through a second cation exchange bed in hydrogen form from the bottom to



produce at the top of said second cation exchange bed a concentrated solution of chromic acid, and displacement water is then passed through said second cation exchange bed and directly to and through the anion exchange bed in the same flow path as but in a direction opposite to the direction in which said concentrated solution of chromium containing anions and said alkali metal hydroxide solution passed through said beds, to displace the liquids remaining in said beds and connecting conduits into the reservoir for said alkali metal hydroxide solution.

4,186,175
CROWN ETHER URANYL HALIDE COMPLEXES

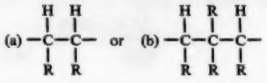
David L. Tomaja, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 25, 1978, Ser. No. 872,144

Int. Cl.[2] B01J *1/10*; C07D *323/00*; C01G *43/02*

U.S. Cl. 204—158 R 45 Claims

11. A method for producing a uranyl halide crown ether complex comprising admixing in a suitable liquid a uranyl halide with a crown ether selected from the group consisting of dicyclohexano-18-crown-6 and crown ethers wherein the cyclic ring consists of 4 to 10-O-J-units wherein J for a particular compound is



wherein each R is independently selected from the group consisting of hydrogen and alkyl radicals having from 1 to 4 carbon atoms, or wherein at least one J is (b) and the remaining J's are (a); and recovering the uranyl halide crown ether complex.

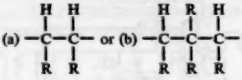
31. A process for the selective separation of at least one uranyl halide from one or more nickel halides and/or copper halides comprising dissolving said at least one halide in a solvent in which a uranyl halide.-18-crown-6 complex is stable and admixing 18-crown-6 therewith under conditions such that a uranyl halide.18-crown-6 complex is formed, wherein said 18-crown-6 is in an amount no greater than the amount needed

to complex all of the uranyl halide in the solution, and recovering the uranyl halide.-18-crown-6 complex that is formed.

34. A process for obtaining uranium oxide from an aqueous solution of uranyl halide comprising:

extracting uranyl halide from said aqueous solution with an organic solvent which will permit the formation of recoverable uranyl halide crown ether complex;

forming at least one uranyl halide crown ether complex by admixing with the organic solution of uranyl halide a suitable amount of at least one crown ether selected from the group consisting of dicyclohexyl-18-crown-6 and crown ethers wherein the cyclic ring consists of 4 to 10-O-J-units wherein J for a particular compound is



wherein each R is indpendently selected from the group consisting of hydrogen and alkyl radicals having from 1 to 4 carbon atoms, or wherein at least one J is (b) and the remaining J'are (a);

contacting said uranyl halide crown ether complex with water, carboxylate ion, and light under conditions sufficient to produce uranium oxide hydrate; and

recovering said uranium oxide hydrate.

4,186,176

METHOD OF SIMULTANEOUSLY REMOVING SULFUR DIOXIDE AND NITROGEN OXIDES FROM EXHAUST GASES

Taketsugu Kitamura, and Hitoshi Takagi, both of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 21, 1978, Ser. No. 927,249

Claims priority, application Japan, Aug. 4, 1977, 52/93003; Nov. 22, 1977, 52/13941

Int. Cl.[2] C01B *17/04*; B01D *53/00*

U.S. Cl. 423—235 **17 Claims**

1. A method of simultaneously removing sulfur dioxide and nitrogen oxides from an exhaust gas which comprises:

contacting the exhaust gas with an aqueous absorbing solution containing an iron chelate complex and an alkali metal sulfite to form alkali metal sulfur oxides comprising an alkali metal dithionate in the aqueous absorbing solution;

separating the alkali metal sulfur oxides formed and accumulated from part or the whole of the aqueous absorbing solution by crystallization; and

subjecting the alkali metal sulfur oxides separated together with a carbonaceous material to decomposition-reduction reaction at a temperature of at least about 700° C. to form an alkali metal sulfide and a gas comprising sulfur dioxide and carbon dioxide.

4,186,177

METHOD FOR CATALYTICALLY REDUCING NITROGEN OXIDES USING MOVING CATALYST BED REACTOR

Shujiro Shiga, Chiba; Takeshi Katsumata, Ichihara; Yasushi Okamoto, Ichihara, and Tadashi Higasa, Ichihara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 18, 1977, Ser. No. 816,806

Claims priority, application Japan, Jul. 20, 1976, 51-87005

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—239 **5 Claims**

1. In the method for the removal of nitrogen oxides from heavy oil combustion exhaust gases containing nitrogen oxides, sulfur oxides and dusts by a catalytic reduction process using a moving catalyst bed reactor wherein the exhaust gases are catalytically contacted with ammonia at 250° to 450° C., the improvement comprises introducing a sealing gas having a temperature of 200° C. or higher and a pressure higher than the average pressure at the outlet and inlet of the moving catalyst bed reactor into the portions of the reactor where the catalyst is taken out therefrom and is again supplied thereto.

4,186,178

ALUMINA DISPERSION BEHAVIOR

Richard K. Oberlander, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Filed Oct. 2, 1978, Ser. No. 947,785

Int. Cl.[2] C01F *7/02*

U.S. Cl. 423—265 **2 Claims**

1. A method for stabilizing alumina slurries against viscosity increases while improving acid dispersibility comprising slurrying alumina to be stabilized in water, heating said alumina slurry at temperatures of from about 40° C. to about 100° C. for from about 5 minutes to about 10 hours, removing the treatment water and readding water and peptizing agents to form a viscosity stabilized, acid dispersible slurry.

2. A method as described in claim 1 wherein the alumina is alpha alumina monohydrate.

4,186,179

PROCESS FOR PRODUCING OXIDIZED OR CARBON FIBERS

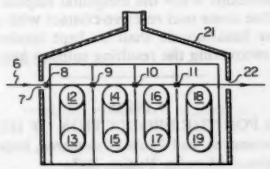
Kosuke Katsuki, and Shizuo Watanabe, both of Ehime, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 910,871, May 30, 1978, abandoned. This application Feb. 14, 1979, Ser. No. 12,119

Claims priority, application Japan, May 30, 1977, 52-62091

Int. Cl.[2] D01F *9/14, 9/22*

U.S. Cl. 423—447.4 **10 Claims**



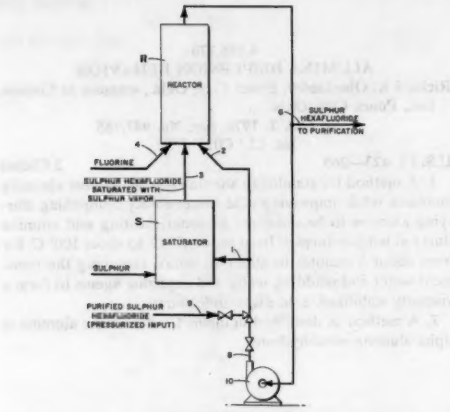
2. An improvement in a process for producing carbon fibers wherein precursor fibers comprised of carbonizable continuous filaments are repeatedly brought into or out of contact with the surface of a heated body, maintained at a temperature in the range of from approximately 200° to 400° C., in an oxidizing gaseous atmosphere to be thereby oxidized, and then, the oxidized fibers are heated in a nonoxidizing gaseous atmosphere maintained at a temperature of at least approximately 800° C.;

said improvement comprising using, as the precursor fibers, an interlaced filament yarn substantially having no crimps or loops and comprised of continuous filaments entangled with each other along the logitudinal direction thereof to an extent such that the coherency factor of the yarn is in the range of from approximately 20 to 100.

4,186,180
METHOD FOR THE PREPARATION OF SULPHUR HEXAFLUORIDE OF HIGH PURITY

Alberto Di Gioacchino; Giulio Tommasi, and Mario de Manuele, all of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Apr. 17, 1978, Ser. No. 897,741
Claims priority, application Italy, Apr. 19, 1977, 22611 A/77
Int. Cl.[2] C01B *17/45*
U.S. Cl. 423—469 **5 Claims**



1. A process for the preparation of sulphur hexafluoride of high purity, from elemental fluorine in gaseous phase and elemental sulphur in vapor phase, and operating with an excess of fluorine, characterized by feeding the fluorine into a reaction chamber through inlets in a metal plate, maintained at between 30° and 70° C., while feeding the sulphur through the nozzle of a burner, regulating a current of an inert gas comprising sulphur hexafluoride which is saturated with sulphur by passing same through a zone containing molten sulphur at a temperature between 250° and 500° C., and subsequently superheating the said inert gas thus saturated with sulphur vapor to a temperature between 300° and 550° C., and introducing a separate current of inert gas comprising sulphur hexafluoride between the metal plate and the burner so as to ensure that the flame that develops when the elemental sulphur and the elemental fluorine come into reactive contact with each other to form sulphur hexafluoride shall be kept insulated from the nozzle, and recovering the resulting sulphur hexafluoride.

4,186,181
PROCESS FOR THE PRODUCTION OF HYDROGEN

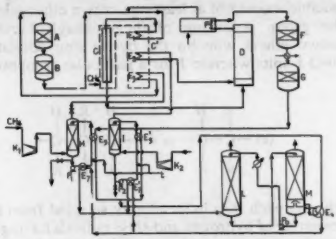
Giuseppe Giammarco, and Paolo Giammarco, both of S. Marco n.3242, Palazzo Morolin, Venice, Italy

Filed Jun. 27, 1978, Ser. No. 919,516
Claims priority, application Italy, Jun. 27, 1977, 68483 A/77; Feb. 3, 1978, 67218 A/78
Int. Cl.[2] C01B *1/13*
U.S. Cl. 423—650 **9 Claims**

7. In a process for the production of hydrogen in which a first gaseous process feed comprising gaseous hydrocarbons is reacted with steam in a reforming unit, in which the resulting reaction gases are then reacted with a second gaseous process feed comprising air and with steam in shift conversion units, in which the resulting conversion gases are treated in an unit for the removal of CO_2 and/or H_2S in which steam necessary for the said reactions is produced in a process boiler by means of the heat obtained from said units, and in which the condensation waters obtained from said units and the water feeding the boiler are purified, the improvement which comprises:

(a) recovering and re-utilizing the waste heat contained in the gases and the liquids issuing from said units to heat an aqueous liquid to a temperature lower than the boiling temprature of water at the operating pressure of said units;

(b) delivering at least part of the gaseous feeds at a temperature lower than the temperature of the heated aqueous liquid from step (a) first to a saturation zone, contacting therein said gaseous process feeds with the said aqueous liquid heated in (a), and using the recovered heat contained in said aqueous liquid to saturate said gaseous process feeds with steam at a temperature lower than the boiling temperature at the operating pressure of reforming; and



(c) heating the resulting mixture of gaseous process feeds and saturation steam obtained in (b) and delivering said mixture to the reforming unit together with a further amount of steam obtained from the process boiler.

4,186,182
SEROLOGICAL TEST FOR *NEISSERIA GONORRHOEAE* ANTIBODIES

Hassan A. Gaafar, Voorheesville, and Dora D'Arcangelis, Albany, both of N.Y., assignors to Research Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 674,628, Apr. 7, 1976, abandoned, which is a continuation of Ser. No. 554,061, Feb. 28, 1975, abandoned, which is a division of Ser. No. 385,863, Aug. 6, 1973, abandoned, which is a continuation-in-part of Ser. No. 285,128, Aug. 31, 1972, abandoned. This application Sep. 7, 1977, Ser. No. 831,128
Int. Cl.[2] G01N *33/16*; A61K *43/00*
U.S. Cl. 424—1 **23 Claims**

1. A serological method for determining the presence of Neisseria gonorrhoeae antibodies in human serum which comprises diluting the serum to be tested in physiological saline at a dilution of about 1:2 to 1:1000, heating the diluted serum at about 56° C. to 65° C. for from about 15 to 30 minutes and thereafter incubating with a composition containing a heat labile, species specific antigen produced from a growth culture of *Neisseria gonorrhoeae* to form an antigen-antibody conjugate when said antibodies are present and detecting the presence of said conjugate; the antigen being protein in nature and characterized as follows:

1. partially inactivated by heating at about 56° C. for about 30 minutes and completely inactivated by boiling for 1 h,
2. stable in an aqueous medium at pH values of 3–11,
3. stable when incubated with the following enzymes:
   deoxynucleic acidase
   ribonucleic acidase
   dextransase
   meuraminidase
   lysosyme,
4. inactivated when incubated with trypsin,
5. isoelectric point of 4±0.2,
6. molecular weight of active subunits of 37,000–40,000 as determined by SDS-polyacrylamide gel,
7. contains 1–10% carbohydrate and 2–3% organic phosphorus, and
8. soluble in acqueous media containing surface active

agents, and insoluble in methanol, chloroform, and acetone.

4,186,183

LIPOSOME CARRIERS IN CHEMOTHERAPY OF LEISHMANIASIS

Edgar A. Steck, Silver Spring, Md., and Carl R. Alving, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 29, 1978, Ser. No. 891,257

Int. Cl.[2] A61K *33/24, 9/50;* B01J *13/02*

U.S. Cl. 424—38 **18 Claims**

18. A composition for the chemotherapy treatment of leishmaniasis comprising a leishmanicidally effective amount of a liposome-encapsulated antimonial drug.

4,186,184

SELECTIVE ADMINISTRATION OF DRUG WITH OCULAR THERAPEUTIC SYSTEM

Alejandro Zaffaroni, Atherton, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Continuation of Ser. No. 864,432, Dec. 27, 1977. This application Apr. 23, 1979, Ser. No. 32,498

Int. Cl.[2] A61K *9/22;* A61M *31/00*

U.S. Cl. 424—14 **27 Claims**

1. A method for administering drug to a preselected surface of the lid of an eye comprising the steps of:

(a) placing in the eye a therapeutic system comprising: a drug, a drug delivery module sized, shaped and adapted as a platform for comfortable retention in the eye and for housing the drug, said module including a delivery portal defining a surface area of the module for releasing the drug from the system; and,

(b) positioning the system in the eye by orienting the portal towards the preselected internal surface of the lid for effective administration of drug thereto.

4,186,185

COMPOSITIONS COMPRISING ARYLENE SUBSTITUTED POLY(ORTHOESTERS) CONTAINING USEFUL AGENTS

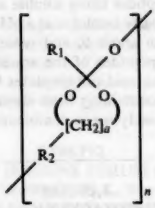
Richard C. Capozza, Palo Alto, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 837,308, Sep. 28, 1977, Pat. No. 4,136,252, which is a continuation-in-part of Ser. No. 675,185, Apr. 8, 1976, Pat. No. 4,066,747. This application Dec. 26, 1978, Ser. No. 972,737

Int. Cl.[2] A61K *9/22, 31/74*

U.S. Cl. 424—19 **8 Claims**

1. A composition of matter comprising an orthoester polymer of the general formula:



wherein R_1 is a member selected from the group consisting of hydrogen, alkyl of 1 to 20 carbon atoms, alkenyl of 2 to 20 carbon atoms, cycloalkyl of 3 to 8 carbon atoms, cycloalkyl of 3 to 8 carbon atoms substituted with a member selected from the group consisting of alkyl of 1 to 20 carbon atoms, alkenyl of 2 to 20 carbon atoms and alkoxy of 1 to 20 carbon atoms, cycloalkenyl of 4 to 8 carbon atoms, cycloalkenyl of 4 to 8 carbon atoms substituted with a member selected from the group consisting of alkyl of 1 to 20 carbon atoms, alkenyl of 2 to 20 carbon atoms and alkoxy of 1 to 20 carbon atoms, and aryl of 6 to 36 carbon atoms, R_2 is an arylene of 6 to 36 carbon atoms; a is 2 to 3, n is greater than 10, and from about 0.01% to about 40% by weight of a beneficial drug dispersed in said polymer, and wherein the drug is released at a controlled and continuous rate to a biological environment of use as the polymer erodes over a prolonged period of time.

4,186,186

GUANIDINE ACCELERATORS FOR PEROXIDE HAIR BLEACHING COMPOSITIONS

Holger Tesmann, Dusseldorf; Erwin Weinrich, Haan, and Edgar Lieske, Dusseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Jan. 30, 1978, Ser. No. 873,219

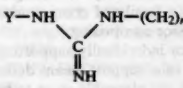
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1977, 2704905

Int. Cl.[2] A61K *7/135*

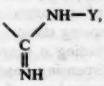
U.S. Cl. 424—62 **7 Claims**

1. A composition for bleaching hair, consisting essentially of

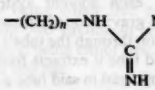
(a) 0.1% to 10% by weight of a guanidine derivative of the formula



wherein R is a member selected from the group consisting of hydrogen, the radical



and the radical



Y is a member selected from the group consisting of hydrogen, the NH_2 radical, and an alkyl radical having 1 to 4 carbon atoms, and n is the integer 2 or 3, or a water soluble acid addition salt thereof,

(b) 1% to 20%, by weight of an ammonia-free alkalinization agent in an amount sufficient to give the composition a pH of 8–10.5,

(c) 2% to 8% by weight, calculated as hydrogen peroxide, of a peroxide oxidation agent,

(d) 0 to 20% by weight of ethylene diurea,

(e) 0 to 0.01 mole/liter of heavy metal cations,

(f) 0 to 10% by weight of thickening agents,

(g) 0 to 10% by weight of surface active agents,

(h) 0 to 0.1% by weight of a peroxide oxidant stabilizer,

(i) 0 to 2% by weight of additional conventional ingredients,

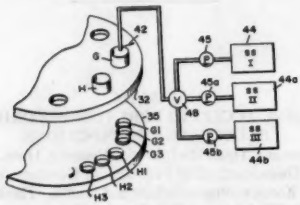
(j) 10% to 70% by weight of solvent.

4,186,187

SAMPLE PROCESSOR FOR THE AUTOMATIC EXTRACTION OF FAMILIES OF COMPOUNDS FROM LIQUID SAMPLES AND/OR HOMOGENIZED SOLID SAMPLES SUSPENDED IN A LIQUID

Vilhelm J. Jahnsen, Lake View Terrace, and Charles F. Campen, Jr., Arcadia, both of Calif., assignors to California Institute of Technology, Pasedena, Calif.

Continuation of Ser. No. 274,216, Jul. 24, 1972, abandoned. This application Feb. 25, 1974, Ser. No. 445,484
Int. Cl.[2] B01D *15/00, 15/08*
U.S. Cl. 422—64 9 Claims



1. For use in combination with a plurality of discrete separate extraction tubes, each tube comprising a hollow cylinder having an open top end, defining an input end, and an opposite permanently open bottom end, defining a permanently open output end, and packed with packing material between said ends with a liquid sample comprising a plurality of chemical compounds, held in a stationary state on said packing material, a sample processor for successively extracting n different extracts, each comprising a family of compounds from each of said samples, the processor comprising:

tube support means for individually supporting each of said tubes thereon, said tube support means defining apertures in which said tubes are placeable so as to be temporarily supported therein, each tube being removable from said tube support means by merely pulling the tube out of the supporting aperture;

control means for steppingly moving said tube support means so that each of said tubes is successively positioned vertically at a dispensing station;

dispensing means including n sources of different solvent systems, a single dispensing head positioned at said dispensing station above and spaced apart from the input end of any tube positioned thereat, and means for successively dispensing through said dispensing head said solvent systems, whereby as each solvent system is dispensed through said head it gravitationally flows into the tube at said dispensing station through the tube's input end, and as it flows through said tube it extracts from the liquid sample on the packing material in said tube a different extract, representing a different family of compounds, with each of said extracts gravitationally flowing out of said tube through the output end thereof; and

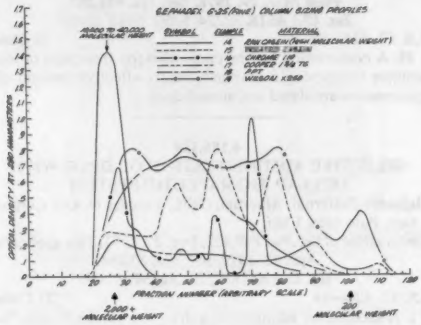
receiving means physically separated from said tube support means and said tubes and positionable below the output end of any tube at said dispensing station and spaced apart therefrom and including n separate containers, each having a top open end, associated with each of said extraction tubes, said control means successively stepping said receiving means so that the n containers associated with each tube at the dispensing station are successively positioned below said tube, whereby as each extract gravitationally flows out of the tube at said dispensing station through the tube's permanently open output end the extract flows by gravity directly into a different one of the n containers associated with the tube through the container's top open end, with none of the extracts exiting any of said tubes returning to any of the tubes.

4,186,188

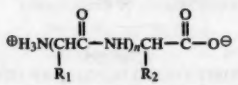
TREATING HAIR WITH COSMETIC FORMULATIONS CONTAINING POLYPEPTIDES

Janet A. Gumprecht, Marina Del Rey, Calif., and assignee of Redken Laboratories, Inc., 20, Canoga Park, Calif.

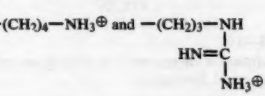
Continuation-in-part of Ser. No. 635,309, Nov. 26, 1975, abandoned. This application Oct. 25, 1977, Ser. No. 845,057
Int. Cl.[2] A61K *7/06*
U.S. Cl. 424—70 6 Claims


SEPHADEX G-25 (FINE) COLUMN ELUTE PROFILES
OPTICAL DENSITY AT 280 MILLIMICRONS
FRACTION NUMBER (ARBITRARY SCALE)
2,000 + MOLECULAR WEIGHT
200 MOLECULAR WEIGHT

1. A method for treating hair to improve the manageability, body and sheen thereof which comprises applying to the hair an aqueous solution having a pH from about 4 to about 7, said aqueous solution containing polypeptides, including a cosmetically effective amount of charged polypeptides, having two sterically unhindered positive charges, which charged polypeptides have the formula:



wherein n is an integer sufficient to provide a molecular weight of the polypeptide of from about 200 to about 2,000; each R_1 is independently a side group attached to the alpha carbon of a naturally occurring amino acid; and R_2 is selected from the group consisting of:



said charged polypeptides being soluble at a pH of from about 4 to about 9 and partially insoluble at a pH less than about 4 and at a pH greater than about 9, and wherein at least 16 mole percent of the polypeptides of the aqueous solution are said charged polypeptides; said polypeptides being formed by hydrolysis of proteins containing from about 12% to about 70% by weight arginine and lysine in combination by trypsin catalysis.

4,186,189

ABSORBABLE PHARMACEUTICAL COMPOSITIONS BASED ON POLY(ALKYLENE OXALATES)

Shalaby W. Shalaby, Long Valley, and Dennis D. Jamiolkowski, Paterson, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Sep. 28, 1977, Ser. No. 837,076
Int. Cl.[2] A61K *31/74, 9/32, 9/22, 9/52*
U.S. Cl. 424—78 13 Claims

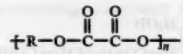
1. In a pharmaceutical depot composition for parenteral

administration of effective amounts of a drug released slowly over an extended period of time which comprises a combination of

(a) from 1 to 99 percent by weight of composition of a drug in an effective depot amount greater than the single dose amount, and

(b) a solid, absorbable polymer which is nonreactive toward body tissue and which undergoes biodegradation in the presence of body fluids into products which are metabolized or excreted by the body without adverse body reaction,

the improvement comprising employing as said absorbable polymer a poly(alkylene oxalate) having the formula



wherein R is a C_3 to C_{16} alkylene and n is the degree of polymerization resulting in a polymer inherent viscosity of at least 0.20 determined at 25° C. on a 0.1 g/dl solution of polymer in $CHCl_3$ or hexafluoroisopropanol.

4,186,190

METHOD OF TREATING BURNS USING A POLY-ε-CAPROLACTONE

John B. Gregory, Wayland, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 13, 1978, Ser. No. 959,952

Int. Cl.[2] A61K *31/74*

U.S. Cl. 424—78 **6 Claims**

1. A method for treating a burn wound comprising the steps of:

A. applying a solution containing about 100 parts by weight of a poly-ε-caprolactone having a molecular weight in the range of from 2000 to 300,000 and about 33 parts by weight of a plasticizer selected from the group consisting of triethyl citrate and triacetin dissolved in a methyl acetate-methylene chloride mixture to the burn wound; and

B. allowing said methyl acetate-methylene chloride mixture to evaporate.

4,186,191

NOVEL COMPLEXES OF POLYOXAZOLINES OR POLYOXAZINES AND HALOGENS, INTERHALOGENS OR PSEUDOHALOGENS AND PROCESS FOR PREPARING SAME

Thomas A. Chamberlin, and Sonia W. Bangs, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 830,529, Sep. 6, 1977, Pat. No. 4,144,211. This application Dec. 11, 1978, Ser. No. 968,228

Int. Cl.[2] C08L *79/04;* C08G *73/06;* A61L *13/00*

U.S. Cl. 424—78 **6 Claims**

1. A process for sanitizing or disinfecting a substrate contaminated with microorganisms comprising contacting said substrate with an aqueous solution of a solid complex comprising (a) a poly-2-oxazoline or poly-2-oxazine, and (b) a halogen, selected from the group consisting of bromine and iodine.

4,186,192

STABILIZED IMMUNE SERUM GLOBULIN

John L. Lundblad, El Cerrito; Willis L. Warner, San Rafael, and Peter M. Fernandes, Concord, all of Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Dec. 18, 1978, Ser. No. 970,686

Int. Cl.[2] A61K *39/00, 35/14, 37/00*

U.S. Cl. 424—85 **20 Claims**

1. A stabilized immune serum globulin preparation comprising an aqueous solution of a therapeutically effective amount of molecules of ISG and maltose, the amount of maltose being sufficient to inhibit shedding of the globulin over prolonged periods of time.

4,186,193

HEPATITIS B ANTIGEN

William J. McAleer, Ambler, and Edward H. Wasmuth, Telford, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 768,236, Feb. 14, 1977, abandoned, which is a division of Ser. No. 587,507, Jun. 16, 1975, Pat. No. 4,024,243. This application Oct. 25, 1977, Ser. No. 845,016

Int. Cl.[2] A61K *39/12*

U.S. Cl. 424—89 **3 Claims**

1. A composition comprising HB_sAg in an aqueous solution of sodium bromide.

2. A composition according to claim 1 wherein the aqueous solution of sodium bromide is a density gradient solution.

4,186,194

WATER SOLUBLE AGENTS EFFECTIVE AS IMMUNOLOGICAL ADJUVANTS FOR STIMULATING, IN THE HOST THE IMMUNE RESPONSE TO VARIOUS ANTIGENS AND COMPOSITIONS, NOTABLY VACCINES CONTAINING SAID WATER SOLUBLE AGENTS

Arlette Adam, Palaiseau; Francoise Audibert, Neuilly; Louis Chedid; Jean Choay, both of Paris; Rita Ciorbaru, Montrouge; Fabrielle Ellouz, Bagneux; Dominique Juy, Paris; Pierre Lefrancier, Bures sur Yvette; Claude Merser, Olivet; Jean-Francois Petit, Paris; Pierre Sinay, Orleans, and Edgar Lederer, Sceaux, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Oct. 22, 1974, Ser. No. 516,991

Claims priority, application France, Oct. 23, 1973, 73 37806; Jul. 1, 1974, 74 22909

Int. Cl.[2] A61K *39/12;* C07C *103/52;* A61K *39/02, 37/00*

U.S. Cl. 424—89 **99 Claims**

1. The method for enhancing the immunization of a host which comprises administering to a host subject to an immune response caused by administration of an antigen capable of increasing the immune response of the host, a composition which comprises a biologically acceptable carrier and a compound defined by having an N-Acmuramyl, wherein -Ac is acetyl or glycolyl, to the carboxyl of the N-Acmuramyl there being linked a peptide chain which comprises 2 to 8 residues of aminoacids, the first aminoacid residue comprising alanyl, seryl or glycyl, and the second aminoacid residue comprising glutamyl or aspartyl, one of the carboxyl of this second aminoacid residue being either free or substituted, or when there are more than two aminoacid residues, the carboxyl of this second aminoacid being either free, substituted or linked to another aminoacid residue.

4,186,195

VIRUS INSECTICIDE COMPOSITION

William C. Yearian, Fayetteville, Ark., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation of Ser. No. 862,364, Dec. 20, 1977, abandoned, which is a continuation of Ser. No. 705,157, Jul. 14, 1976, abandoned. This application Jul. 10, 1978, Ser. No. 923,292

Int. Cl.[2] A01N *9/02, 9/20, 15/00*

U.S. Cl. 424—93 **17 Claims**

1. An insecticidal composition for combatting pests of the family Heliothis comprising 1 part by weight N'-(4-chloro-o-tolyl)-N,N-dimethylformamidine and the equivalent of from 0.5 to 1.5 parts by weight of a Heliothis virus formulation having an LD_{50} against the first instar Heliothis zea larvae of 0.1 micrograms per milliliter.

4,186,196
TOPICAL ANTI-FUNGICIDE PREPARATION

Edward A. Lasher, 1141 Shadow Hill Way, Beverly Hills, Calif. 90210

Filed Apr. 19, 1976, Ser. No. 678,021
Int. Cl.[2] A61K *33/42, 31/20*
U.S. Cl. 424—128 6 Claims

1. A topical preparation for the treatment of skin fungus infections and psoriasis, comprising:

(a) undecylenic acid;

(b) a phosphorous-containing acid which forms orthophosphoric acid in the presence of water or air; and

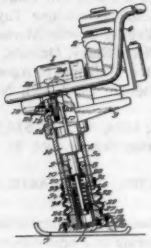
(c) a solvent for said (a) and (b);

said (b) comprising between about 5% and about 85% by weight of the total weight of said (a) and (b), and said (a) and (b) comprising between about 25% and about 75% by weight of the total weight of said (a), (b) and (c).

4,186,197
VIBRATION RAM

Susumu Tetsuo, 17-1, Kita Senzoku 3, Ohta-ku, Tokyo, Japan

Filed Dec. 27, 1978, Ser. No. 973,701
Int. Cl.[2] E01C *19/34*
U.S. Cl. 404—133 4 Claims



1. A vibration ram comprising:

an engine;

an outer cylinder fixedly attached to said engine;

an inner cylinder slidably mounted within said outer cylinder;

a foot plate attached to a lower end of said inner cylinder;

a top plate closing an upper end of said inner cylinder, said top plate including an opening;

an operating rod slidably extending through said top plate opening, said operating rod being reciprocatingly driven by said engine;

an upper stop means positioned on an upper portion of said operating rod;

a lower stop means positioned on a lower portion of said operating rod spaced from said upper stop means;

an upper slide member slidably mounted on said operating rod, said upper slide member being adapted to abut against said upper stop means;

a lower slide member slidably mounted on said operating rod, said upper slide member being adapted to abut against said lower stop means;

a partially compressed spring means positioned between said upper and lower slide members, said spring means urging said upper and lower slide members into abutment with said upper and lower stop means, respectively; and

seat means fixedly positioned relative to the lower end of said inner cylinder for limiting the lower movement of said lower slide member independently of said lower stop means.

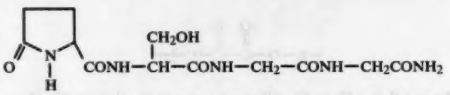
4,186,198
CHEMICAL COMPOUNDS

Karl-Ludwig Reichelt, and Olav E. Trygstad, both of Oslo, Norway, assignors to Nyegaard & Co. A/S, Olso, Norway

Filed Sep. 6, 1978, Ser. No. 939,970
Claims priority, application United Kingdom, Sep. 6, 1977, 37194/77
Int. Cl.[2] A61K *37/00;* C07C *103/52*
U.S. Cl. 424—177 11 Claims

1. The compound of the formula:

(I)



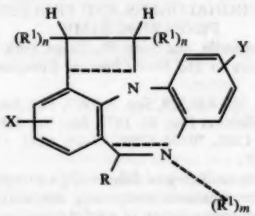
(wherein the pyroglutamyl and seryl moieties are of the L-series).

4,186,199
INDOLO-,1,2-DIHYDROINDOLO-, AND 1,2,6,7-TETRAHYDROINDOLO [1,7-AB][1,5] BENZODIAZEPINES

Edward J. Glamkowski, Warren, and James M. Fortunato, Somerville, both of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Filed Nov. 2, 1978, Ser. No. 956,904
Int. Cl.[2] A61K *31/62, 31/625;* C07D *487/04*
U.S. Cl. 424—232 27 Claims

1. A compound of the formula



or a pharmaceutically acceptable acid addition salt thereof, wherein

X is hydrogen or halogen;

Y is hydrogen, halogen or trifluoromethyl;

R is hydrogen, lower alkyl, cycloalkyl of 3 to 6 carbon atoms, phenyl, halophenyl, furyl or phenylloweralkyl;

R^1 is hydrogen;

n and m are independently 0 or 1, but n is not 0 when m is 1, and the bonds between positions 1 and 2 and between positions 6 and 7 are respectively saturated when n and m are 1 and are unsaturated when n and ma are 0.

26. A method of treating pain which comprises administering to a patient in need thereof a pharmaceutically effective amount of a compound defined in claim 1.

4,186,200

NOVEL FUSED DERIVATIVES OF 2-PYRIDONES

Kazuo Kubo, Urawa; Noriki Ito, Iwatsuki; Isao Souzu, Urawa; Yasuo Isomura, Yokohama; Hiroshige Homma, Omiya, and Masuo Murakami, Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

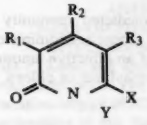
Continuation-in-part of Ser. No. 814,325, Jul. 11, 1977, abandoned. This application Feb. 9, 1978, Ser. No. 876,517

Claims priority, application Japan, Jul. 22, 1976, 51-87486; Dec. 29, 1976, 51-158228; Jan. 5, 1977, 51-464; Mar. 31, 1977, 52-36384; Apr. 13, 1977, 52-42423

Int. Cl.[2] A61K *31/415;* C07D *471/04*

U.S. Cl. 424—256 21 Claims

1. A nitrogen-containing compound represented by the formula



wherein one of R_1 and R_2 represents a lower alkyl group, a phenyl group, a halophenyl group, or a lower alkoxyphenyl group and the other of them represents a hydrogen atom, a lower alkyl group or a phenyl lower alkyl group; R_3 represents a hydrogen atom, a lower alkyl group, a phenyl group, or a phenyl lower alkyl group; X represents an imino group, or the group shown by

wherein R_4 represents a lower alkyl group, a hydroxy lower alkyl group, a hydroxy lower alkyl group, a cycloalkyl group, or a phenyl lower alkyl group; and Y represents an ethylene group which may be substituted by a lower alkyl group, or a vinylene group which may be substituted by a lower alkyl group; said X represents the group shown by

when one of said R_1 and R_2 is a lower alkyl group and the other of them is a hydrogen atom, and said Y is an ethylene group, and the pharmaceutically acceptable non-toxic salts thereof.

17. Analgesic anti-inflammatory composition comprising an effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier or excipient.

4,186,201

METHODS OF USING 8(TETRAZOL-5-YLCARBAMOYL)ISOQUINOLINE COMPOUNDS

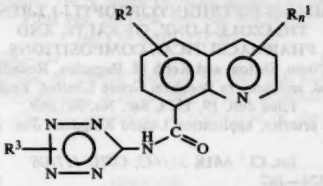
Edward H. Erickson, Woodbury, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Division of Ser. No. 860,625, Dec. 14, 1977, Pat. No. 4,147,694, which is a continuation-in-part of Ser. No. 766,511, Feb. 7, 1977, abandoned. This application Dec. 20, 1978, Ser. No. 971,425

Int. Cl.[2] A61K *31/47*

U.S. Cl. 424—258 4 Claims

1. A method for inhibiting the result of antibody-antigen reactions in mammals which comprises administration to a mammal susceptible to allergic reaction of an effective amount of a compound of the formula



wherein R^1 is alkyl or alkoxy of one or two carbon atoms, R^2 is alkyl or alkoxy of one or two carbon atoms, hydrogen, nitro or halogen, R^3 is hydrogen or alkyl of one to four carbon atoms and n is zero, one or two, and pharmaceutically acceptable salts thereof.

4,186,202

PHENYL-PYRIDYLAMINE DERIVATIVES

Per A. E. Carlsson, Göteborg; Bernt S. E. Carnmalm, Södertälje; Vante B. Ross, Södertälje, and Carl B. J. Ulff, Södertälje, all of Sweden, assignors to Astra Lakemedel Aktiebolag, Södertälje, Sweden

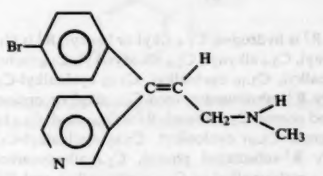
Continuation of Ser. No. 632,698, Nov. 17, 1975, abandoned. This application Mar. 2, 1977, Ser. No. 773,397

Claims priority, application Sweden, Nov. 21, 1974, 7414622

Int. Cl.[2] A61K *31/44;* C07D *213/38*

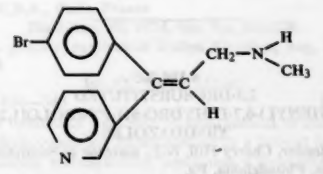
U.S. Cl. 424—263 11 Claims

4. A compound having the formula



and having a melting point range between about 202° C. to about 205° C. as the oxalate salt, or a pharmaceutically acceptable acid addition salt thereof.

5. A compound having the formula



and having a melting point range between about 198° C. to about 201° C. as the oxalate salt, or a pharmaceutically acceptable acid addition salt thereof.

4,186,203
2-[GAMMA-(1-PIPERIDINYL)PROPYL]-1,2-BENZISOTHIAZOLE-3-ONE, ITS SALTS, AND PHARMACEUTICAL COMPOSITIONS

Barbara Nunn, Sutton, and Keith H. Baggaley, Redhill, both of England, assignors to Beecham Group Limited, England

Filed Jun. 19, 1978, Ser. No. 917,069

Claims priority, application United Kingdom, Jun. 20, 1977, 25599/77

Int. Cl.[2] A61K *31/445;* C07D *417/08*

U.S. Cl. 424—267 4 Claims

1. The compound 2-[Gamma-(1-piperidinyl)propyl]-1,2-benzisothiazol-3-one or a pharmaceutically acceptable acid addition salt thereof.

3. A pharmaceutical composition having antithrombotic activity which comprises an antithrombotically effective amount of a compound according to claim 1 together with at least one pharmaceutically acceptable carrier.

4,186,204
ACYLAMINO DERIVATIVES

Roger G. Harrison, Farnborough; William B. Jamieson, Woking; William J. Ross, Lightwater, and John C. Saunders, Maidenhead, all of England, assignors to Eli Lilly and Company and Lilly Industries Limited, both of Henrietta Pl., England

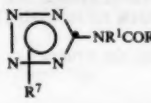
Continuation of Ser. No. 848,840, Nov. 7, 1977, abandoned, which is a continuation of Ser. No. 691,965, Jun. 1, 1976, abandoned. This application Feb. 1, 1979, Ser. No. 8,649

Claims priority, application United Kingdom, Jun. 5, 1975, 24221/75

Int. Cl.[2] A61K *31/41;* C07D *257/04*

U.S. Cl. 424—269 24 Claims

1. A heteroaryl compound of the formula



wherein R^7 is hydrogen, C_{1-4} alkyl or benzyl; R^1 is C_{1-10} alkyl, C_{3-6} alkenyl, C_{3-6} alkynyl, C_{2-6} alkoxyalkyl, C_{2-6} carboxyalkyl, C_{1-6} haloalkyl, C_{3-10} cycloalkyl, C_{3-10} cycloalkyl-C_{1-6} alkyl, optionally R^3-substituted phenyl-C_{1-6} alkyl or optionally R^3-substituted phenyl-C_{2-6} alkenyl; R^2 is C_{1-8} alkyl, C_{1-6} haloalkyl, C_{2-6} alkenyl, C_{3-10} cycloalkyl, C_{3-10} cycloalkyl-C_{1-6} alkyl, optionally R^3-substituted phenyl, C_{1-4} alkoxycarbonyl-C_{1-8} alkyl, C_{2-8} carboxyalkyl or C_{3-6} acyloxyalkyl; and R^3 is halogen, trifluoromethyl, methyl, methoxy or nitro.

19. A pharmaceutical formulation for the treatment of asthma comprising an amount of a compound of claim 1 which is effective for such treatment, admixed with a pharmaceutically acceptable carrier.

4,186,205
2,3-DI(4-SUBSTITUTED PHENYL)-6,7-DIHYDRO-5H-PYRROLO[1,2-A]IMIDAZOLES

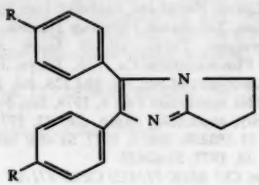
Paul E. Bender, Cherry Hill, N.J., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Jan. 8, 1979, Ser. No. 1,620

Int. Cl.[2] A61K *31/415;* C07D *487/04*

U.S. Cl. 424—273 R 12 Claims

1. A compound of the formula:



in which:

R is lower alkoxy of from one to four carbon atoms, methylthio or chloro, or a non-toxic pharmaceutically acceptable salt thereof.

12. A method of regulating cell-mediated immunity and producing antiarthritic activity which comprises administering internally to an animal in need thereof an effective amount of a compound of claim 1 where R is methylthio or chloro.

4,186,206
TREATMENT OF SWINE DYSENTERY

Geoffrey H. Palmer, Crawley, England, assignor to Beecham Group Limited, England

Filed Jul. 21, 1978, Ser. No. 926,644

Claims priority, application United Kingdom, Jul. 27, 1977, 31475/77

Int. Cl.[2] A61K *31/35*

U.S. Cl. 424—283 9 Claims

1. A method for the treatment of swine dysentery which comprises administering to an infected swine, an effective amount of pseudomonic acid, a non-toxic salt or non-toxic ester thereof.

9. The method of treating swine dysentery which comprices administering pseudomonic acid, either as the free acid or as a non-toxic alkali metal or amine salt, in combination with the swine's drinking water at a concentration of about 30 to 600 μg/ml or with the swine's feed at a concentration of about 100 to 1000 μg/gm.

4,186,207
STABLE AQUEOUS OR AQUEOUS-ALCOHOLIC SOLUTIONS OF FAT-SOLUBLE PERFUME OILS OR DRUGS CONTAINING N-(HYDROXYALKYL)AMIDE-ETHOXYLATES

Ulrich Zeidler, and Fanny Scheuermann, both of Düsseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft Auf Aktien

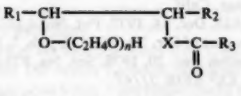
Division of Ser. No. 826,044, Aug. 19, 1977. This application Feb. 9, 1979, Ser. No. 10,757

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1976, 2639293

Int. Cl.[2] A61K *7/46, 31/07, 31/16, 31/355*

U.S. Cl. 424—284 11 Claims

1. Clear, stable, aqueous or aqueous-alcoholic solutions of a fat-soluble ethereal perfume oil or fat-soluble vitamin, consisting essentially of from 0.5 to 5% by weight, relative to the total weight of the solution, of a N-(hydroxyalkyl)-amide-ethoxylate of the formula



wherein R_1 and R_2 independently of each other are a member selected from the group consisting of alkyl having 1 to 18 carbon atoms and hydrogen, R_3 is a member selected from the group consisting of alkyl having 1 to 5 carbon atoms and phenyl, X is a member selected from the group consisting of

>NH and >N—$(C_2H_4O)_mH$, and n and m independently of each other are an integer from 0 to 40, with the proviso that the total of the carbon atoms of R_1+R_2 is from 6 to 20 and the total of n+m is from 6 to 40, from 0.1% to 1% by weight relative to the total weight of the solution of a fat-soluble ethereal perfume oil or fat-soluble vitamin, wherein the amount of said N-(hydroxyalkyl)amide-ethoxylate is at least four times the amount of said perfume oil or vitamin, from 0 to 10% by weight relative to the total weight of the solution of a water-miscible alcohol, and the remainder to 100% by weight of the conventional substances used in said solution including water, where the amount of water or water and alcohol is from 70% to 99% by weight, relative to the total weight of the solution.

4,186,208

ANTI-DEPRESSANT N-(3,4-DICHLOROPHENYL)-N-DIMETHYLAMINOALKYLENE AMIDES

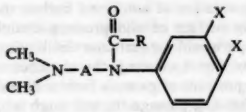
Michael P. Kane, and Jacob Szmuszkovicz, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 934,239, Aug. 16, 1978, which is a continuation of Ser. No. 838,767, Oct. 3, 1977, abandoned, which is a continuation of Ser. No. 746,863, Dec. 2, 1976, abandoned. This application Jan. 29, 1979, Ser. No. 7,127

Int. Cl.[2] C07C *103/19, 103/44;* **A61K** *31/16, 31/165*

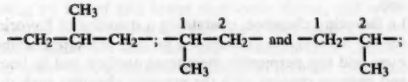
U.S. Cl. 424—324 **7 Claims**

1. A pharmaceutical formulation which comprises an anti-depressive-effective amount of a compound of Formula III:



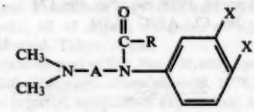
III

wherein A is a group selected from —$(CH_2)_2$; —$(CH_2)_3$— —$(CH_2)_4$—; —$(CH_2)_5$—;



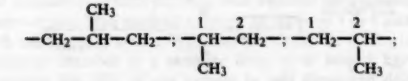
wherein R is ethyl, vinyl or cyclopropyl; and wherein X is bromo or chloro; or a pharmacologically acceptable acid addition salt, and a pharmaceutically acceptable carrier.

6. A method for treatment of depression in mammals which comprises administration to said mammals of an anti-depressant-effective quantity of a compound of Formula III:



III

wherein A is a group selected from —$(CH_2)_2$—; —$(CH_2)_3$—; —$(CH_2)_4$—; —$(CH_2)_5$—;



wherein R is ethyl, vinyl or cyclopropyl; and wherein X is bromo or chloro, or a pharmacologically acceptable acid addition salt, in a pharmacologically acceptable carrier.

4,186,209

SUBSTITUTED ACETANILIDES AS MEDICINALS

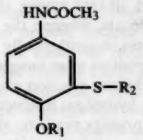
David J. Jollow, 716 N. Shore Dr., Charleston, S.C. 29412

Filed Jun. 26, 1978, Ser. No. 919,282

Int. Cl.[2] A61K *31/165*

U.S. Cl. 424—324 **4 Claims**

1. A method of treating mammal for pain and abnormally high fever comprising administering to said mammal a therapeutically effective amount of a compound of the general formula:



wherein each of R_1 and R_2 represents a hydrogen atom or a lower alkyl group having from one to three carbon atoms.

4,186,210

METHOD OF TREATMENT WITH GLYCINAMIDES

Ian T. Barnish, Ramsgate; Peter E. Cross; John C. Danilewicz, both of Canterbury, and Malcolm Morville, Cliftonville, all of England, assignors to Pfizer Inc., New York, N.Y.

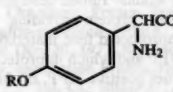
Division of Ser. No. 834,768, Sep. 19, 1977, Pat. No. 4,148,920. This application Aug. 30, 1978, Ser. No. 938,019

Claims priority, application United Kingdom, Sep. 28, 1976, 40306/76

Int. Cl.[2] A61K *31/24, 31/165, 31/195*

U.S. Cl. 424—324 **6 Claims**

1. A method of treating a mammalian subject suffering from a disease or condition attributable to reduced carbohydrate metabolism, which comprises orally or parenterally administering to said subject a carbohydrate metabolism increasing amount of the L- or DL- form of a compound of the formula:



or a pharmaceutcially acceptable salt thereof, wherein R is hydrogen or methyl and R^1 is NH_2.

4,186,211

HIGHER ALKANOL COMPOSITIONS AND THE USE THEREOF IN TREATMENT OF PROSTATE DISORDERS

Jacques Debat, Paris, France, assignor to Societe Dite: Institut de Recherches Chimiques et Biologiques Appliquees-I.R.C.E.B.A., Paris, France

Filed Aug. 30, 1974, Ser. No. 502,036

Claims priority, application United Kingdom, Aug. 29, 1974, 40568/74

Int. Cl.[2] A61K *31/045*

U.S. Cl. 424—343 **11 Claims**

1. The method of treatment of enlargement of the prostate gland which comprises administering to a patient in need of said treatment a composition containing a therapeutically effective amount of 1-docosanol, 13-cis-docosen-1-ol, 9-cis, 12-cis-octadecadien-1-ol, or 2-eicosanol in association with a physiologically acceptable vehicle.

4,186,212

ANIMAL FEED CONTAINING HIGH MOLECULAR WEIGHT ALIPHATIC ALCOHOLS

F. Maurice Howell, 5507 20th St., Lubbock, Tex. 79407

Filed Mar. 9, 1978, Ser. No. 884,764
Int. Cl.[2] A61K *31/045, 31/01*
U.S. Cl. 424—343 6 Claims

1. A food composition having enhanced energy content comprising a basal animal diet containing sufficient protein, salts, vitamins, and minerals to support normal growth and from 0.5 to 20 percent on a dry weight basis of a linear aliphatic synthetic alkanol, said alkanol having about 20 to about 32 carbon atoms per molecule, wherein the alkanol has an even number of carbon atoms, is synthetically derived, and is supplied to the food composition as an unseparated part of hydrolysis product of an ethylene reaction growth product on an aluminum trialkyl, the hydrolysis product comprising a blend of said linear aliphatic primary synthetic alkanol plus branched alcohols having carbon atoms ranging from C_{20} to C_{32}, wherein about half of the weight of the alcohol components of the product are branched, and wherein about one-third of the product weight is comprised of aliphatic hydrocarbons having about 24 to about 40 carbon atoms per molecule.

4,186,213

METHOD OF FEEDING CATTLE FOR MAXIMIZED PROTEIN UTILIZATION

Wise Burroughs, and Allen H. Trenkle, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Continuation-in-part of Ser. No. 814,976, Jul. 12, 1977, abandoned. This application Oct. 13, 1978, Ser. No. 951,169
Int. Cl.[2] A23K *1/00*
U.S. Cl. 426—2 18 Claims

1. A method of feeding cattle to assure maximized protein utilization, comprising feeding to the cattle a feed ration including a plurality of different naturally-occurring protein-providing feed materials, at least one of said materials being a source of metabolizable protein having a negative Urea Fermentation Potential (UFP) which material has been treated by heat or with aldehyde or tannin to reduce the solubility of the protein and protect it against rumen destruction, the rest of said naturally-occurring protein-providing feed materials being selected from unprotected feed materials at least one of which has a positive UFP and which unprotected feed materials as a group have a net positive UFP, the total of said protected feed materials comprising from 3 to 45% by weight on a dry matter basis of the total of the protected and unprotected feed materials, and also feeding urea in an amount at least equal to the net positive UFP value of said unprotected feed material.

4,186,214

MOLASSES CHEWING GUM

Vernon J. Crouse, III, Hagerstown, and Robert F. Farmer, III, Rockville, both of Md., assignors to The Gillette Company, Boston, Mass.

Filed May 30, 1978, Ser. No. 910,477
Int. Cl.[2] A23G *3/30*
U.S. Cl. 426—3 7 Claims

1. A chewing gum composition having prolonged flavor qualities comprising:

A. From about 15 to about 40 percent by weight of a synthetic polymer-based gum base;

B. From about 1 to about 20 percent by weight of molasses; and

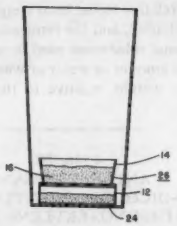
C. From about 0.1 to about 3 percent by weight of a natural or synthetic essential oil flavor.

4,186,215

BEVERAGE CARBONATION ARRANGEMENT

Johannes A. Buchel, Danbury, Conn., assignor to PepsiCo. Inc., Purchase, N.Y.

Filed Mar. 2, 1978, Ser. No. 882,750
Int. Cl.[2] A23L *2/40*
U.S. Cl. 426—86 6 Claims



1. An arrangment for carbonating a beverage at a substantially constant carbonation rate, comprising:

(a) a pressure chamber immersible in the liquid base of the beverage for generating carbon dioxide;

(b) a carbonating mixture including a carbonate and an acid located in said pressure chamber;

(c) means for generating carbon dioxide at a substantially constant carbonation rate by establishing an equilibrium between the pressure of carbon dioxide within the chamber and the quantity of liquid entering the chamber to produce the generation of additional carbon dioxide, including the top surface of said pressure chamber being formed of a permeable membrane facilitating passage therethrough of liquid entering the chamber in inverse relation to the pressure of gaseous carbon dioxide therein and further inhibiting passage therethrough into the carbonated beverage of resultant carbonation reaction products including undesirable salts tending to adversely affect the flavor of said beverage, said permeable membrane having a pore size in the range of from 10 to 100 microns; and

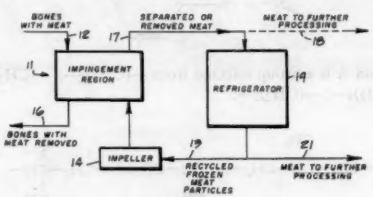
(d) a flavoring chamber, containing a quantity of flavoring for the beverage, superimposed on said pressure chamber over said top permeable membrane surface and in liquid and gaseous contact with the pressure chamber such that gaseous carbon dioxide bubbles passing upwardly through said permeable surface into and through said flavoring chamber assist in mixing the flavoring into the beverage.

4,186,216

METHOD FOR DEBONING MEAT

Eldon N. Roth, 99 Madera Ct., San Ramon, Calif. 94583

Filed Apr. 14, 1978, Ser. No. 896,174
Int. Cl.[2] A22C *17/04*
U.S. Cl. 426—480 10 Claims



1. In a method of removing meat from bones, the steps comprising arranging meat containing bones in an impingement region, impinging small frozen meat particles, at a rela-

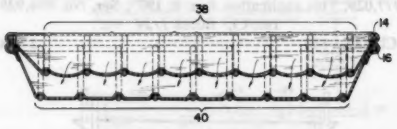
tively high velocity, against said meat containing bones while agitating said meat containing bones in order to separate the meat from the bones, said agitation exposing all surfaces of said meat containing bones to the impinging particles in order to assure complete removal of the meat from the bones, removing the impinged meat particles and the separated meat from the impingement region for further processing and supplying additional frozen particles of meat to an impeller for propelling them into the impingement region.

4,186,217

METHOD FOR LOW FAT COOKING AND CONJOINING COOKING RACKS THEREFOR

Eli Tchack, 5 Nottingham Rd., Livingston, N.J. 07039

Filed May 19, 1978, Ser. No. 907,846
Int. Cl.[2] A23L *1/31*
U.S. Cl. 426—523 **8 Claims**



1. Metallic conjoining cooking racks comprising an upper rack having an outer frame and a plurality of U-shaped cross members connected across and attached to said outer frame; a lower rack having an outer frame substantially identical to said upper rack outer frame and a plurality of U-shaped cross members connected across and attached to said lower rack outer frame; a first metal foil sheet on said U-shaped cross members of said upper rack and a second metal foil sheet on said U-shaped cross members of said lower rack, said first metal foil sheet having a plurality of holes therethrough between said U-shaped cross members of said upper rack and said upper rack set into said lower rack with said upper rack outer frame resting on top of said lower rack outer frame, and with said U-shaped cross members of said upper rack spaced above said second metal foil sheet and said U-shaped cross members of said lower rack a distance sufficient to provide for collection on said second foil sheet of grease which drops through said holes in said first metal foil sheet when food is cooked while supported on said upper foil covered sheet.

4,186,218

PROCESS FOR PREPARING IMPROVED SOY PROTEIN MATERIALS

Teruo Gomi, Yokohama; Yuji Hisa, and Takahiko Soeda, both of Kawasaki, all of Japan, assignors to Ajinomoto Company, Incorporated, Tokyo, Japan

Continuation-in-part of Ser. No. 790,440, Apr. 25, 1977, Pat. No. 4,113,716. This application Mar. 23, 1978, Ser. No. 889,340
Claims priority, application Japan, Jan. 10, 1978, 53-1454
Int. Cl.[2] A23J *1/14*; A23L *1/20*
U.S. Cl. 426—598 **16 Claims**

1. A process for preparing soy protein material having improved solubility which comprises preparing an aqueous slurry of denatured defatted soybean flake material having a weight ratio of said flake material to water of between 1 to 4 and 1 to 20, and ejecting said aqueous slurry through an orifice into a holding chamber at a pressure drop of at least 1 kg/cm^2; wherein the NSI of soy protein in said denatured defatted soybean flake material is not more than 70%, and the NSI of soy protein in the resultant pressure ejected slurry is higher than that of said denatured defatted soybean flake material by at least 5%.

4,186,219

MAINTAINING THE EFFECTIVENESS OF A COATING COMPOSITION

Wilbur S. Hall, Plymouth Meeting, Pa., assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 609,016, Aug. 29, 1975, abandoned. This application Aug. 15, 1977, Ser. No. 824,804
Int. Cl.[2] B05D *1/18, 7/14*
U.S. Cl. 427—8 **30 Claims**

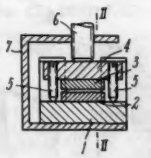
1. In an autodepositing coating method wherein an organic coating is applied to a metallic surface by immersing the surface in an acidic aqueous coating composition containing dispersed particles of an organic coating-forming material and wherein metal ions are dissolved from said surface by the chemical action of said coating composition and build up in concentration as said composition is used to coat additional metallic surfaces, and wherein said composition includes a constituent capable of combining with an oxidized form of said metal ions to form a material which is soluble in the composition, and wherein said coating-forming material becomes unstable in the region of said surface and deposits thereon to form said organic coating, the thickness or amount of which increases during at least a portion of the time said surface is immersed in said composition, and wherein said composition forms on said surface within a predetermined time a coating of predetermined thickness, and wherein additional metallic surfaces are immersed in said composition and are coated as set forth, and wherein during continued use, said composition, the ingredients of which are replenished, as needed, begins to form thinner coatings within said predetermined time on additional of said surfaces or to destablize, and wherein said metal ions are capable of existing in a higher valence state, the improvement comprising adding to the composition a material which oxidizes said metal ions to said higher valence state, said material being added in an amount such that said coating composition forms on said metallic surfaces coatings having said predetermined thickness within said predetermined time, and wherein the oxidized form of said metal ions combines with said constituent to form said soluble material.

4,186,220

CONTROL OF IMPREGNANT OR COATING MATERIAL

Georges Chiron, Chambery, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Dec. 20, 1977, Ser. No. 862,508
Claims priority, application France, Dec. 21, 1976, 76 38466
Int. Cl.[2] B05D *3/12*
U.S. Cl. 427—8 **6 Claims**

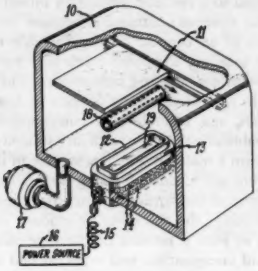


1. A method of controlling the quantity of a liquid such as an impregnant or coating applied to linear materials such as fibers, strands or the like comprising moving the linear material in a path which extends through a compression zone formed by a pair of elongated rigid elements disposed transversely of the path, the space between the elements being calibrated to permit passage of the linear material while effecting removal of liquid in excess of a predetermined amount, and imparting laterally sweeping movement to the linear material so that it sweeps the rigid elements within the compression zone as it moves linearly through the zone.

4,186,221
METHOD OF APPLYING GLASS LAYERS TO POLYCARBONATE

Walter L. Hall, Mt. Vernon, Ind., and James S. Humphrey, Jr., Clemmons, N.C., assignors to General Electric Company, Pittsfield, Mass.

Filed Nov. 13, 1978, Ser. No. 959,585
Int. Cl.[2] B05D 7/24
U.S. Cl. 427—45 6 Claims



1. A method of providing an adherent thin glass film of uniform thickness on a polycarbonate substrate which comprises the steps of:

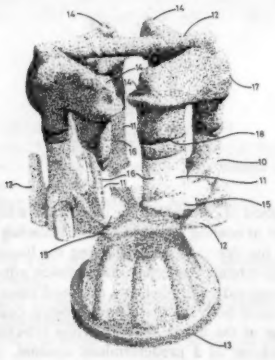
(i) producing a stream of vaporized glass by heating a source of glass by radio frequency induction in an evacuated chamber; and,

(ii) passing a polycarbonate substrate through said stream of vaporized glass with the longitudinal axis of said substrate transverse to said stream of vaporized glass such that said stream of vaporized glass contacts and is uniformly deposited on the polycarbonate substrate surface exposed thereto.

4,186,222
MOULD INSULATION

Hubert D. Sellars; David Mills, and Michael F. J. Ford, all of Bristol, England, assignors to Rolls-Royce (1971) Limited, London, England

Continuation of Ser. No. 720,589, Sep. 7, 1976, abandoned. This application Apr. 13, 1978, Ser. No. 896,211
Claims priority, application United Kingdom, Sep. 20, 1975, 38711/75
Int. Cl.[2] B22C 9/08
U.S. Cl. 427—134 6 Claims

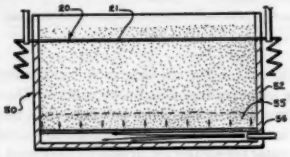


1. A method of thermally insulating selected regions of a finished shell mould comprising the steps of selectively building-up one or more layers of thermal insulation using at least one insulator selected from the group consisting of vermiculite, perlite and diatomite on different regions of the exterior surface of the mould, each layer being formed by first dipping the selected region of the shell mould into a container of an adherent liquid coating containing a relatively finely divided particulate thermal insulator and subsequently bringing the coated region into contact with moving particles of a relatively coarsely divided particulate thermal insulator, whereby said particles adhere to the coating on said shell mould to form a layer of insulation thereon.

4,186,223
PROCESS FOR COATING A WIRE SPRING AND EVALUATING PREVIOUS HEAT TREAT OF SAID WIRE SPRING

William L. Hancock, Lexington, Ky., assignor to Hoover Universal, Inc., Saline, Mich.

Continuation of Ser. No. 638,180, Dec. 5, 1975, abandoned, which is a division of Ser. No. 506,946, Sep. 18, 1974, Pat. No. 3,977,029. This application Jun. 9, 1977, Ser. No. 804,925
Int. Cl.[2] B05D 1/24
U.S. Cl. 427—185 1 Claim



1. The process for evaluating the adequacy of a heat treatment of a formed wire spring having a straight portion, said process comprising visually examining a coating of heat curable thermoplastic material applied to the surface of said straight portion of said formed wire spring immediately following the heat treatment thereof, said straight portion of said spring being adapted to be secured to another straight portion of wire by conventional clips which encircle the straight wire portions and wherein said material has thermal properties which enable visual examination of the material following coating thereof on a heated spring to determine the temperature range to which the spring was heated prior to coating, said thermoplastic material being selected so that it has thermal properties related to said predetermined temperature range whereby a sandy appearance of said coating indicates a heat treatment temperature of the examined spring below the predetermined range; and a blistered and discolored coating indicates a heat treatment temperature of the examined spring above the predetermined range, said process comprising the steps of:

(a) subjecting said wire spring to a heat treatment in which it is intended to heat said wire spring to a temperature within a predetermined temperature range adequate to stress relieve said spring;

(b) applying said thermoplastic material by means of a fluidized bed to at least the surface of said straight portion of said spring immediately following said heat treatment so that the thickness of said coating material is sufficient to enable one of said clips to bite into said coating material so as to be maintained in a fixed position on said spring straight portion; and

(c) visually examining the coated surface of the wire spring to assure that the heat treatment temperature was within said predetermined temperature range;

(i) a sandy appearance indicating a heat treatment temperature of the examined spring below the predetermined range; and

(ii) a blistered and discolored coating indicating a heat treat-

ment temperature of the examined spring above the predetermined range.

4,186,224

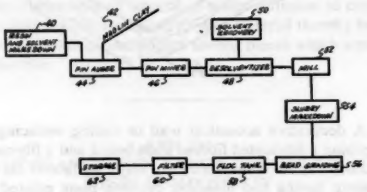
RECORD MEMBER AND ENCAPSULATED CLAY FOR USE THEREIN

Thomas A. Grillo, Macon, Ga., assignor to J. M. Huber Corporation, Locust, N.J.

Continuation of Ser. No. 682,552, May 3, 1976, abandoned, which is a continuation of Ser. No. 532,658, Dec. 13, 1974, abandoned, which is a continuation of Ser. No. 386,635, Aug. 8, 1973, abandoned, which is a continuation of Ser. No. 155,018, Jun. 21, 1971, abandoned. This application Jun. 27, 1977, Ser. No. 809,955

Int. Cl.[2] B41M 5/22

U.S. Cl. 427—221 3 Claims



1. A method for producing a coating composition of kaolin clay particles encapsulated within an oil soluble organic polymeric material for use in preparing a sensitized surface for a record member, said method comprising the steps of:

(a) heating a body of kaolin clay to a temperature in the range of 80° to 120° C.;

(b) combining said heated clay with a mixture of said organic polymeric material and a solvent heated to a temperature in the range of 90° to 125° C.;

(c) subjecting the combined mixture of clay, polymer and solvent to high shear mixing and compaction by flowing said combined mixture through a high speed high intensity pin mixer having a pitch decreasing in the direction of flow, said pin mixer operating at rotational speeds on the order of 100 to 1000 rpm;

(d) desolventizing said combined mixture in the presence of shearing forces;

(e) cooling said desolventized mixture;

(f) milling the cooled mixture;

(g) making down the milled mixture in water to form a slurry; and

(h) bead grinding said slurry.

4,186,225

METHOD OF COATING THE INTERIOR SURFACES OF A HOLLOW ARTICLE

Jack L. Smith, Lake in the Hills, Ill., and Leon W. Mitchell, New Milford, Conn., assignors to American Can Company, Greenwich, Conn.

Continuation of Ser. No. 711,580, Aug. 4, 1976, abandoned. This application Mar. 22, 1978, Ser. No. 888,924

Int. Cl.[2] B05B 7/08

U.S. Cl. 427—233 8 Claims

1. A method of coating the interior surfaces of a hollow one-piece container comprised of a generally cylindrical sidewall having one end open, and an end wall closing the opposite end thereof, said sidewall and end wall being integrally formed from a thin steel blank, comprising the steps of; spraying liquid coating material into said article through said open end thereof to produce one deposit therewithin, said one deposit being confined substantially to the entire inside surface of said sidewall and subsequently to produce another deposit, said another deposit covering primarily the entire inside surface of said end wall and the inside surface of said sidewall to produce a final deposit of substantially uniform thickness extending completely over said sidewall and said end wall, said spraying to produce each said deposit being effected for a period of about 1 to 4 revolutions of said container with said container being rotated about its longitudinal axis and with said coating material at a temperature of about 20°to 85° Celsius; and subsequently effecting the initial and concurrent solidification of both deposits to produce a substantially uniform, void-free coating.

4,186,226

AUTODEPOSITED COATINGS WITH INCREASED SURFACE SLIP

Timothy J. C. Smith, Hatfield Township, Montgomery County, Pa., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jun. 21, 1978, Ser. No. 917,560

Int. Cl.[2] B05D 5/08, 1/18, 1/36

U.S. Cl. 427—340 5 Claims

1. In a process wherein a resinous coating is formed on a metallic surface by immersing the surface in an acidic aqueous coating composition containing dispersed particles of resin, wherein said composition forms on said surface a resinous coating which increases in thickness the longer the surface is immersed in the composition and wherein the resinous coating is contacted with an aqueous solution containing Cr to improve properties of the resinous coating, the improvement which comprises increasing the surface slip of the applied resinous coating by contacting the applied, unfused resinous coating with an aqueous solution of a Cr-containing compound chosen from the group consisting of:

(i) hexavalent chromium compounds; and

(ii) mixtures of hexavalent chromium/reduced chromium,

said solution having dispersed therein particles of a polymer which has a lower coefficient of friction than the autodeposited resinous coating.

4,186,227

COATING SUBSTANCES

Helmut Wulff, Witten, and Hans-Jürgen Hass, Troisdorf-Spich, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Nov. 29, 1976, Ser. No. 745,715

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1975, 2554220

Int. Cl.[2] B05D 3/02

U.S. Cl. 427—388 A 17 Claims

1. A linear polyester comprising the polymeric condensation product of:

A1. an acid component comprising 45 to 55 mole percent of terephthalic acid or its esterifiable derivatives;

A2. 35 to 45 mole percent of another aromatic dicarboxylic acid or its esterifiable derivatives;

A3. 0 to 20 mole percent of a cycloaliphatic and/or aliphatic dicarboxylic acid; and

an alcohol component comprising

B1. 20 to 30 mole percent of hydroxypivalic acid neopentyl glycol ester;

B2. 20 to 30 mole percent of an aliphatic diol with a branched carbon atom;

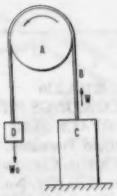
B3. 40 to 60 mole percent of ethylene glycol of which up to 10 mole percent can be replaced by ether diols or by diprimary aliphatic diols of more than two carbon atoms in the chain,

said linear polyester having an average molecular weight of 1500 to 4000.

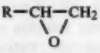
4,186,228
MAGNETIC RECORDING MEDIUM

Hiroshi Ogawa; Matsuaki Nakamura, and Yasuo Tamai, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sep. 7, 1978, Ser. No. 940,241
Claims priority, application Japan, Sep. 19, 1977, 52-112399
Int. Cl.[2] H01F *10/02*
U.S. Cl. 428—413 6 Claims



1. A magnetic recording medium comprising a non-magnetic support having thereon a magnetic recording layer containing a finely divided ferromagnetic powder, a binder and at least one 1,2-epoxyalkane represented by the general formula (I)



(I)

wherein R represents an alkyl group having 10 to 30 carbon atoms; in an amount of about 0.05 to about 3 parts by weight per 100 parts by weight of the ferromagnetic powder.

4,186,229
METHOD OF MANUFACTURING BASE PLATES SUITABLE FOR PRESSING RECORDS AND PLATES MANUFACTURED BY THE SAME

Johannes F. Roeloffzen, Driekwartweg 5, Sas van Gent, Netherlands

Continuation of Ser. No. 747,877, Dec. 6, 1976, abandoned. This application Dec. 12, 1977, Ser. No. 859,676
Claims priority, application United Kingdom, Dec. 4, 1975, 49914/75
Int. Cl.[2] B32B *3/02;* G11B *3/70;* B29D *17/00*
U.S. Cl. 428—65 16 Claims

1. A method for manufacturing records comprising the ordered steps of:

(a) providing a core film of flax fibers;

(b) applying a synthetic polymeric binding material to said film so as to bind said fibers together; and

(c) coating each side of said film with a single coat of vinyl resin.

4,186,230
THERMOPLASTIC MOLDABLE LATEX FOAM MAT

Edward A. Sinclair, Kent, and John M. Kalbfleisch, Cuyahoga Falls, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 2, 1978, Ser. No. 947,918
Int. Cl.[2] D03D *27/00;* D04H *11/00*
U.S. Cl. 428—95 1 Claim

1. A molded mat which comprises a nonwoven fabric sheet or a tufted carpet having a tufted face surface and a back surface, at least one of said surfaces containing a coating of a foam, said foam being composed of a blend of 15 to 50 parts of a resin and 85 to 50 parts of an elastomer, said mat containing the foam coating being molded to give the mat a shaped contour, said resin being a polystyrene or copolymer of about 15 percent butadiene and about 85 percent styrene and said elastomer being a copolymer of about 75 percent butadiene and about 25 percent styrene or natural rubber.

4,186,231
DECORATIVE ACOUSTICAL PANEL FOR CEILINGS AND WALLS

Mark R. Weitzman, Toledo, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jun. 26, 1978, Ser. No. 918,884
Int. Cl.[2] B29D *27/00;* B29C *21/00;* B32B *3/00*
U.S. Cl. 428—158 3 Claims

1. A decorative acoustical wall or ceiling surfacing panel comprising a fabricated fibrous glass board and a fibrous glass fabric adhered on an inner side to a major surface of the board, the fabric having had foamable printing paste printed on an outer side thereof in a desired pattern and the foamable printing paste having been expanded and cured.

4,186,232
SELF-SUPPORTING ROOF PANEL OF PLASTIC MATERIAL FOR MOTOR VEHICLES AND THE LIKE

Vincenzo Cocca, Cormano; Ivano Tommasi, Senago, and Pasqualino Cau, Oggiono, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Jun. 27, 1978, Ser. No. 919,448
Claims priority, application Italy, Jul. 1, 1977, 25298 A/77
Int. Cl.[2] B32B *1/04, 3/02*
U.S. Cl. 428—177 3 Claims

1. A self-supporting roof plate for motor vehicles and the like, characterized in that said roof plate consists essentially of a composite structure comprising a plate of rigid thermoplastic material bonded to a layer of foamed plastic material having a thermo-acoustical insulating function, and a layer of an aesthetically pleasing plastic material, said multi-layer structure being so shaped as to include on opposite sides two hook-like or S-shaped arcuate strips forming elastically yielding strips, adapted for the assemblage of the structure against the roof body of the car, by snap-fitting said arcuate strips into grooves prearranged between the roof ceiling and the body sides of the vehicle.

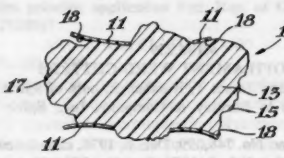
4,186,233
DISPOSABLE COMPOSITE INSENSITIVE TO SURFACE MOISTURE BUT DISINTEGRATABLE IN AQUEOUS LIQUID

Richard M. Krajewski, St. Louis, and Robert E. Erickson, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 27, 1978, Ser. No. 890,159
Int. Cl.[2] B32B *7/02;* A61F *13/16*
U.S. Cl. 428—213 10 Claims

1. A disposable composite comprising an absorbent, swell-

able film of a water-insoluble, water-swellable polymer being sufficiently covered on its two major surfaces by a hydrophobic coating of a water-insoluble, water-impervious polymer adapted to provide the film with resistance to surface and environmental moisture such that premature disintegration of



the composite is prevented; the absorbent, swellable film being capable of absorbing an amount of water sufficient to convert the film into a weak, expanded gel-like material thereby breaking the hydrophobic coating into several pieces which separate from the film.

4,186,234

LIGHT TRANSMISSIBLE HIGH DENSITY ELASTIC RESIN COMPOSITION

Kazumi Sakashita, Nara; Kenji Hiratsuka, Kasugai; Yutaka Umezu, Aichi; Nobuo Nakamura, Inuyama, and Haruhisa Noda, Ichinomiya, all of Japan, assignors to Dai Nippon Toryo Company, Osaka, Japan

Continuation of Ser. No. 622,377, Oct. 14, 1975, abandoned. This application Apr. 17, 1978, Ser. No. 896,506

Claims priority, application Japan, Mar. 3, 1975, 50-24979

Int. Cl.[2] B32B *5/16;* **C08K** *7/20*

U.S. Cl. 428—283 **10 Claims**

1. A light transmissible, high density elastic resin composition having a specific gravity greater than 1.8 and which is a sound barrier, which comprises:

100 wt. parts of a thermoplastic resin or a mixture of a thermoplastic resin and a plasticizer and

100 to 500 wt. parts of a spherical lead glass having an average diameter of 40 to 120 μm and a refractive index N_D of 1.5 to 2.2.

7. The light transmissible, high density elastic resin composition of claim 1, wherein the difference between the refractive index of the powdered glass and that of the thermoplastic resin or the mixture of the thermoplastic resin and a plasticizer is in a range of 0–0.8 (N_D).

9. A sheet of the light transmissible, high density elastic resin composition of claim 7 reinforced with a nonwoven fabric.

4,186,235

THERMOPLASTICS ARTICLES HAVING A SURFACE FUSED TO CLOTH

Michael J. Bramwell, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England

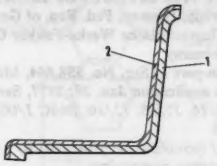
Continuation of Ser. No. 762,161, Jan. 24, 1977, abandoned, which is a continuation of Ser. No. 679,493, Apr. 22, 1976, abandoned. This application Nov. 22, 1978, Ser. No. 963,051

Claims priority, application United Kingdom, Apr. 24, 1975, 17059/75

Int. Cl.[2] B32B *27/00*

U.S. Cl. 428—286 **9 Claims**

1. A thermoplastics article having a surface fused to a cloth wherein the cloth comprises at least 25% by volume of contiguous conjugate fibres at least some of which are fused together at at least some of the points where they touch one another, each conjugate fibre comprising two mutually adhering fibre-forming components one of these which forms at least part of the surface of the fibre can be rendered fusible by a treatment



which does not significantly affect the other component so as to enable contiguous fibres to be fused together.

4,186,236

PINHOLE FREE ASPHALT COATING FOR A FIBROUS MAT AND PROCESS FOR MAKING THE SAME THROUGH USE OF A THIXOTROPIC ASPHALT EMULSION

Glenn A. Heitmann, Morrison, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Filed Oct. 4, 1976, Ser. No. 729,501

Int. Cl.[2] B32B *5/24, 11/10;* **C08L** *95/00;* **C09D** *3/24*

U.S. Cl. 428—291 **9 Claims**

1. An article of manufacture comprising a foamed resin body having adhered to at least one surface thereof a composite article, said article of manufacture being made according to the process which comprises:

(a) providing a fibrous mat having such characteristics as to permit the constituents of said resin body, prior to and during the foaming thereof, to pass therethrough;

(b) providing an asphalt emulsion;

(c) mixing said asphalt emulsion with an additive for making the resulting mixture thixotropic;

(d) coating the side of said mat opposite the side to which said foamed resin body is to be adhered with said thixotropic mixture;

(e) drying said coated mat so as to form a film on said mat, said film having such characteristics as to prevent the constituents of said resin body, prior to and during the foaming thereof, from passing through said film;

(f) thereafter foaming said resin body in place directly on the other side of said coated mat; and

(g) curing said foamed resin body, whereby said coated mat forms a facing for said cured foamed resin body.

7. A process for making an article of manufacture comprising:

(a) providing a fibrous mat having such characteristics as to permit the constituents of a foamable resin body prior to or during the foaming thereof, a pass therethrough;

(b) providing an asphalt emulsion;

(c) mixing said asphalt emulsion with an additive for making the resulting mixture thixotropic;

(d) coating on side of said mat with said thixotropic mixture;

(e) drying said coated mat so as to form a film on said mat, said film having such a characteristics as to prevent the constituents of said resin body, prior to and during the foaming thereof, from passing through said film;

(f) thereafter foaming a resin in place directly on the other side of said coated mat; and

(g) curing said foamed resin, whereby said coated mat forms a facing for said cured foamed resin.

4,186,237

MULTI-COMPONENT PROTECTIVE COVERING FOR CONSTRUCTION PARTS DESIGNED TO PROTECT AGAINST THE EFFECTS OF LIGHTNING

Horst-Joachim Propp, Bremen, Fed. Rep. of Germany, assignor to Vereinigte Flugtechnische Werke-Fokker GmbH, Bremen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 558,664, Mar. 17, 1975, abandoned. This application Jan. 28, 1977, Ser. No. 763,561

Int. Cl.[2] **B32B** *5/16, 15/08, 15/16;* **B64C** *1/00;* **H02G** *13/00*

U.S. Cl. 428—323 **22 Claims**

1. An article of manufacture protected to a degree against the effects of lightning comprising:

(1) a substrate having a covering comprising a material functioning to release ionized or ionizable particles alone or in combination with gas when subjected to the strong electric field preceding an oncoming flash of lightning to thereby generate the formation of a particle cloud above the substrate to fan out the lightning head; and

(2) a conductive material functioning to distribute the electric current of a lightning flash.

18. As an article of manufacture to be protected against lightening, a construction part having a cover comprised of a first release layer of a plastic material which includes additives to release ionizable smoke or gas; an ion release layer on top of the first release layer and being about 1 millimeter thick and made of metal; and a metal layer underneath the first layer, so that ions are released by the metal ion release layer when the part is subjected to a strong local electrical field preceding the striking of the part by a flash of lightening thereby generating an ion cloud which is replenished by ionized particles from the first release layer to fan out the lightening head, the metal layer underneath the first release layer distributing current and dissipating heat.

19. An article of manufacture protected to a degree against the effects of lightening, comprising a construction part serving as substrate and having a covering comprised of a layer made of non-metallic host material which contains a substantial amount of metal-containing additives for releasing ions when subjected to a strong electric field preceding an oncoming flash of lightening and for distributing an electric current induced by the flash, said host material further containing additives for releasing ionizable particles when subjected to the said field so that a cloud of ionized and of ionizable particles develops above the part to fan out the lightening head.

4,186,238

HYDROPHILIC ARTICLES OF WATER-INSOLUBLE POLYMERS

Arno Holst; Michael Kostrzewa, and Helmut Lask, all of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 681,730, Apr. 29, 1976, abandoned, which is a continuation-in-part of Ser. No. 535,972, Dec. 23, 1974, abandoned. This application Sep. 30, 1977, Ser. No. 838,339

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1973, 2364628

Int. Cl.[2] **B32B** *5/16;* **D02G** *3/00*

U.S. Cl. 428—326 **5 Claims**

1. A hydrophilic shaped article in the form of a fiber, a filament, a film or a spongy product consisting essentially of (a) a water-insoluble polymer selected from the group consisting of regenerated cellulose, cellulose ether, cellulose ester, and polyalkylene and capable of forming fibers and films and (b) of from an amount effective to render said article hydrophilic up to 50% by weight of the total weight of the article, of amorphous particles of a size within the range of about 0.01 to 2 mm of an originally water-soluble cellulose ether selected from the group consisting of carboxymethyl cellulose, hydroxyethyl cellulose and methylhydroxyethyl cellulose, prepared from natural cellulose and rendered by chemical modification with a cross-linking agent more than 50% by weight water-insoluble while remaining water-absorbent, said cross-linking agent being selected from the group consisting of dimethylolmethylene bisacrylamide, methylene-bis-acrylamide, tri- and tetrachloropyrimidine, cyanuric chloride, epichlorohydrin, dichloracetic acid, a diepoxide and a di-α-halogenohydrin.

4,186,239

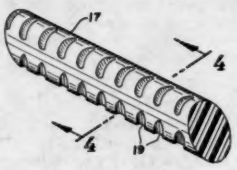
MONOFILAMENT WEED CUTTERS

Charles J. Mize, and James T. Rumbaugh, both of Spirit Lake, Iowa, assignors to Berkley & Company, Inc., Spirit Lake, Iowa

Continuation of Ser. No. 748,099, Dec. 6, 1976, abandoned. This application Feb. 7, 1978, Ser. No. 875,869

Int. Cl.[2] **A01D** *55/18;* **D02G** *3/00*

U.S. Cl. 428—399 **3 Claims**



1. A weed cutting filament attachable at one end to a rotatable hub, for impact severing of vegetation, the filament comprising:

(a) an elongated filamentary member having a generally centrally disposed axis and a predetermined substantially constant cross-sectional dimension with indentations formed at spaced intervals along the length thereof, said indentations being formed at spaced apart arcuate and axial dispositions, said indentations being axially spaced by a distance of at least about 0.003 inch.

4,186,240

THERMOPLASTIC OLEFIN RESIN COMPOSITION AND LAMINATED FILM OR SHEET THEREOF

Akira Matsuda, Iwakuni; Tetsuo Tojo, Ohtake, and Kazuo Iwata, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Filed Mar. 7, 1978, Ser. No. 884,220

Claims priority, application Japan, Sep. 26, 1977, 52-114690; Sep. 27, 1977, 52-115088; Jan. 13, 1978, 53-1876

Int. Cl.[2] **B32B** *27/32*

U.S. Cl. 428—349 **5 Claims**

1. A laminated olefin resin film or sheet comprising a substrate of an isotactic propylene resin and formed on at least one surface thereof, a laminated layer of a thermoplastic olefin resin composition, said composition being composed of a blend of

(i) 50 to 95% by weight, based on the total weight of the blend, of a random copolymer consisting essentially of 55 to 85 mole % of propylene and 45 to 15 mole % of 1-butene and having a heat of fusion of 10 to 80 joules/g determined by differential thermal analysis using a differential scanning calorimeter, and

(ii) 5 to 50% by weight, based on the total weight of the blend, of an isotactic propylene resin containing 0 to 10 mole % of another α-olefin and having a melting point of 135° to 165° C. and a melt index, measured at 230° C., of 0.1 to 20.

4,186,241

INSULATED WIRE AND METHOD FOR PRODUCING SAME

Harald Janssen, Reinbek, Fed. Rep. of Germany, assignor to Dr. Beck & Co. AG, Hamburg, Fed. Rep. of Germany

Filed Dec. 4, 1978, Ser. No. 965,919

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1977, 2753917

Int. Cl.[2] H01B *3/00*

U.S. Cl. 428—458 8 Claims

6. A process for the preparation of insulated wires through the extrusion of a thermoplastic coating, involving the use of a partially crystalline thermoplastic polyamide, said polyamide comprising an acid component and an amine component in a ratio of 1:1 to 1:1.1, wherein said acid component is terephthalic acid or a functional derivative thereof, and said amine component consists of hexamethylenediamine and isophoronediamine, said isophoronediamine comprising at least 5 Mol % of the total amine component, said process comprising passing a conductor wire through a coating zone of an extruder to coat said wire; and treating said wire to regulate the thickness of the applied coating.

4,186,242

PREPARATION OF A LIGNOCELLULOSIC COMPOSITE

Howard W. Holmquist, Bellingham, Wash., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed Mar. 8, 1976, Ser. No. 664,539

Int. Cl.[2] B32B *27/42;* C09J *5/04*

U.S. Cl. 428—528 10 Claims

1. In a process for the preparation of a lignocellulosic composite wherein an urea-formaldehyde resin adhesive is used and the composite is formed by pressing lignocellulosic constituents after application of the adhesive to the constituents, the improvement of decreasing the emission of formaldehyde from the composite, which comprises treating the lignocellulosic constituents separate from the adhesive application step prior to pressing with a sufficient amount of ammonium-base lignosulfonate to decrease the formaldehyde emission from the composite.

8. A lignocellulosic composite obtained by the process of claim 1.

4,186,243

IMAGE PRODUCING SYSTEM

James H. Astbury, and Barrie Broadbent, both of Stockport, England, assignors to CIBA-GEIGY Corporation, Ardsley, N.Y.

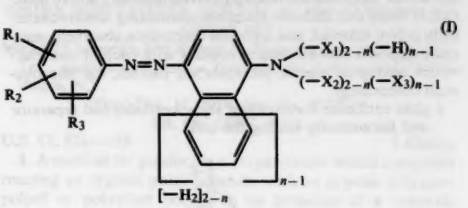
Filed Feb. 11, 1977, Ser. No. 767,853

Claims priority, application United Kingdom, Feb. 25, 1976, 7374/76

Int. Cl.[2] B41M *5/12*

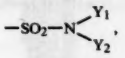
U.S. Cl. 428—537 13 Claims

1. An image producing system, which comprises (a) a paper substrate impregnated or coated with a composition comprising an azo color former and (b) a solid activator composition in the form of a crayon or a pencil, said activator composition comprising a clay capable of activating said color former, a solid organic carrier for the clay and an organic oily liquid solvent having low volatility, the color former having the general formula I



(I)

in which R_1, R_2 and R_3 each represents hydrogen, halogen, alkyl, alkoxy, aryloxy, alkoxycarbonyl, dialkylaminocarbonyl, acylamino, acyl(alkyl)amino,



in which Y_1 and Y_2 each represents alkyl or aryl, or in which Y_1 and Y_2 together represent an alkylene group; X_1 is hydrogen or an alkyl group, X_2 is an alkyl, cyanoalkyl or arylmethylene group or X_1 and X_2 together represent an alkylene group, X_3 is an alkyl or aryl group and n is 1 or 2.

4,186,244

NOVEL SILVER POWDER COMPOSITION

Robert J. Deffeyes, Arlington, and Harris W. Armstrong, Ft. Worth, both of Tex., assignors to Graham Magnetics Inc., Ft. Worth, Tex.

Filed May 3, 1977, Ser. No. 793,384

Int. Cl.[2] B22F *1/00*

U.S. Cl. 428—570 31 Claims

1. A fusible particulate composition of matter having a metal powder substrate and, on the surface of said metal, an organic group which is chemically reacted with the metal of said organic group forming a protective barrier layer on said metal substrate and forming means to reduce the temperature at which said particulate composition can be fused.

4,186,245

ENERGY STORAGE FLYWHEEL

John J. Gilman, Convent Station, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Sep. 28, 1978, Ser. No. 946,481

Int. Cl.[2] B32B *15/02;* G05G *1/00*

U.S. Cl. 428—635 13 Claims

1. A flywheel for rotational energy storage, comprising:

(a) a plurality of circular layers joined concentrically, each layer being composed of a plurality of glassy metal alloy strips joined in planar fashion to allow nearly a 100% packing fraction, said strips having high isotropic specific strength and substantially equal thickness and aspect ratio, said ratio being at least about 5; and

(b) bonding means for providing a joining shear strength between said layers and between said strips within each layer at least about equal to the tensile strength of said strip material divided by said aspect ratio, to form a substantially mechanically monolithic composite structure having nearly the full isotropic strength of said strips.

4,186,246

HERMETICALLY SEALED ELECTROCHEMICAL STORAGE CELL

Raymond K. Sugalski, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.

Filed Aug. 11, 1978, Ser. No. 932,922

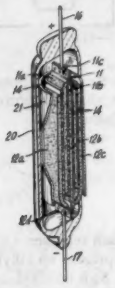
Int. Cl.[2] H01M *2/30*

U.S. Cl. 429—60 15 Claims

1. In a sealed electrochemical storage cell, having at least

one anode electrode containing electrochemically active material, at least one cathode electrode containing electrochemically active material, and a porous electrolyte absorbent separator disposed between and in contact with each of said electrodes having an electrolyte absorbed therein, the improvement comprising:

a glass enclosure surrounding said electrodes and separator and hermetically sealing the cell;



a battery terminal conductor connected to each said anode and cathode and extending through said glass casing from the interior to the exterior thereof, said terminal conductor being bonded directly to said casing in sealing relationship therewith;

the amount of said electrolyte not exceeding the capacity of said separator thereby substantially to preclude the presence of free liquid electrolyte in the cell.

4,186,247

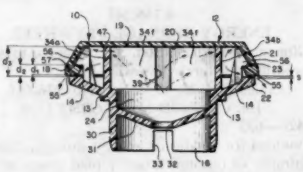
VENTED BATTERY CAP

Verlin A. Mocas, Indianapolis, Ind., assignor to The Richardson Company, Des Plaines, Ill.

Continuation of Ser. No. 767,229, Feb. 9, 1977, Pat. No. 4,098,963. This application May 30, 1978, Ser. No. 910,629

Int. Cl.[2] H01M 2/12

U.S. Cl. 429—88 **24 Claims**



1. A vented cap for an electrical storage battery of the type having at least one filler well through which gas and electrolyte are discharged comprising, in combination:

a base member having a bottom portion, a side wall portion projecting upwardly from said bottom portion and defining a first gap forming portion, at least one hollow vent plug portion projecting downwardly from said bottom portion for insertion into said filler well and including an orifice therein for establishing fluid communication between an interior chamber in said cap and said battery, and an interior wall portion projecting upwardly from said bottom portion and at least partially defining said interior chamber;

a cover member disposed over said base member, said cover member including a second gap forming portion; and

means including a plurality of latch portions projecting from one of said base and cover members into snap-fit engagement with the other of said members to secure said cover member in abutting relationship to said interior wall portion, said interior wall portion being dimensioned to maintain said second gap forming portion of said cover member in spaced relationship to said first gap forming portion of said base member so as to form a vent aperture therebetween for escaping battery gas.

4,186,248

SOLID STATE ELECTROLYTES

Geoffrey W. Mellors, North Royalton, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 27, 1978, Ser. No. 973,552

Int. Cl.[2] H01M 6/18

U.S. Cl. 429—191 **12 Claims**

1. A solid state cell electrolyte comprising an ionically conducting produce of a fused ternary mixture of lead fluoride, an alkali salt selected from the group consisting of sodium, potassium, rubidium and cesium salts in a range of between about 1.0 and about 15.0 mole percent and a fluoride, nitrate or sulfate of magnesium, calcium, strontium or barium in a range between about 1 and about 40 mole percent.

4,186,249

SOLID STATE ELECTROLYTES

Geoffrey W. Mellors, North Royalton, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 27, 1978, Ser. No. 973,554

Int. Cl.[2] H01M 6/18

U.S. Cl. 429—191 **13 Claims**

1. A solid state cell electrolyte comprising an ionically conducting product of a fused binary mixture of lead fluoride (PbF_2) and a range of between about 0.1 and about 15.0 mole percent of cesium fluoride or a metal salt having a cation component selected from the group consisting of sodium, potassium, rubidium and cesium and an anion component selected from the group consisting of chloride, bromide, iodide, cyanide, nitrate, hydroxide, thiocyanate, carbonate, phosphate, sulfate, oxide, formate, acetate and oxalate.

4,186,250

METHOD OF DESENSITIZING IMAGE-BEARING LITHOGRAPHIC PLATES

Walter L. Garrett, Freeland, and Ralph G. Czerepinski, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 586,455, Jun. 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 565,915, Apr. 7, 1975, abandoned. This application Jan. 27, 1977, Ser. No. 763,262

Int. Cl.[2] G03F 7/02; G03C 5/00

U.S. Cl. 96—33 **66 Claims**

1. A method for the treatment of a developed image-bearing lithographic printing plate to render hydrophilic the non-image areas of the plate, comprising applying to the image-bearing plate an aqueous solution comprising water and an active polymer component selected from the group consisting of:

(a) a polyacrylamide-based polymer wherein from about 3 to about 70 percent of the carbonyl sites are carboxyl groups and the balance of said sites are amide moieties;

(b) a physical blend comprised of from about 97 to about 30 weight percent polyacrylamide and from about 3 to about 70 weight percent polyacrylic acid or an alkali metal or ammonium salt thereof;

(c) a physical blend comprised of polyacrylamide, or polyacrylic acid or an alkali metal or ammonium salt thereof, and at least one polyacrylamide-based polymer as described in (a), said polymers being employed in proportions such that of the total carbonyl sites present in the blend, from about 3 to about 70 percent are carboxyl groups and the balance are amide moieties;

(d) a mixture of any two or more of the foregoing (a)–(c);

the weight average molecular weight of each of said polyacrylamide-based polymer, polyacrylamide, and polyacrylic acid or salt thereof being in the range of from about 10,000 to about 1,000,000; and

(e) a co-mixture of one or more of the foregoing (a)–(d) with up to 30 weight percent hydroxypropyl methylcellulose based on the total weight of the co-mixture, said hydroxypropyl methylcellulose being of a type which produces a 2 weight percent aqueous solution having a viscosity of from about 1 to about 100 cP when measured according to ASTM Method D 2363-72;

said solution being applied in an amount sufficient to render substantially all the non-image areas hydrophilic.

4,186,251

COMPOSITION AND METHOD FOR DETERMINATION OF CHOLESTEROL

Peter N. Tarbutton, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Mar. 1, 1973, Ser. No. 337,189
Int. Cl.[2] G01N *31/14*
U.S. Cl. 435—11 **5 Claims**

1. A test device for use in determining total cholesterol in a biological fluid sample comprising a test composition which includes a chemical system having cholesterol ester hydrolase activity, a chemical system having cholesterol oxidase activity, and means for determining at least one of the reaction products produced when free cholesterol is contacted with said chemical system having cholesterol oxidase activity; and a carrier for said test composition.

4,186,252

METHOD FOR PREPARATION OF VITAMIN B1

Ludmila Šilhánková, Prague, Czechoslovakia, assignor to Vysoka skola chemicko-technologicka, Prague, Czechoslovakia

Filed May 2, 1977, Ser. No. 792,704
Int. Cl.[2] C12D *5/02*
U.S. Cl. 435—120 **6 Claims**

1. Method for the preparation of vitamin B_1 which comprises fermenting a mutant of yeast which synthesizes and excretes vitamin B_1 selected from the group consisting of *Saccharomyces cerevisiae* Hansen DBM 159 and *Saccharomyces uvarum* Beijerinck DBM 189 in a growth medium and recovering the vitamin B_1 from the medium.

4,186,253

PERFUSATE FOR PRESERVING ORGAN TO BE TRANSPLANTED AND PRESERVING METHOD

Kazumasa Yokoyama, Toyonaka; Masakazu Iwai, Matsubara; Hiroyuki Okamoto, Akashi, and Noboru Yamada, Amagasaki, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

Filed Oct. 10, 1978, Ser. No. 950,071
Int. Cl.[2] C12B *3/00*; A61K *31/025*
U.S. Cl. 435—240 **16 Claims**

1. A liquid for the perfusional preservation of an organ for transplantation, comprising a modified Ringer's solution characterized by containing potassium ion in a concentration of 8 to 20 meq/liter, and effective amounts of albumin dissolved therein, a liquid perfluorocarbon compound emulsified therein, and an emulsifier.

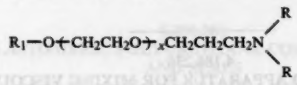
4,186,254

AMINE DERIVATIVES AND USE AS POLYURETHANE CATALYST

Michael Cuscurida, and Robert L. Zimmerman, both of Austin, Tex., assignors to Texaco Development Corporation, White Plains, N.Y.

Filed Dec. 11, 1978, Ser. No. 967,944
Int. Cl.[2] C08G *18/18*
U.S. Cl. 521—115 **5 Claims**

1. A method for producing a polyurethane which comprises reacting an organic polyisocyanate with an organic polyester polyol or polyether polyol in the presence of a catalytic amount of an amine falling within the following structural formula:



where R_1 and R are lower alkyl and x=0–2.

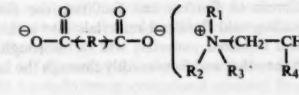
4,186,255

BIS-QUATERNARY AMMONIUM SALTS AS POLYISOCYANURATE CATALYSTS

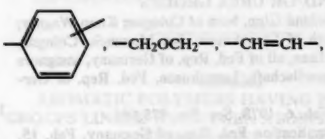
Howard P. Klein, Houston, and George P. Speranza, Austin, both of Tex., assignors to Texaco Development Corporation, White Plains, N.Y.

Filed Mar. 13, 1978, Ser. No. 886,210
Int. Cl.[2] C08G *18/16, 18/14*; C07C *87/30*
U.S. Cl. 521—128 **15 Claims**

1. In a process for preparing a polymer containing recurring isocyanurate and urethane linkages, which polymer comprises the reaction product of a polyol and an aromatic polyisocyanate, while utilizing an isocyanurate group formation catalyst; the improvement which comprises employing as said isocyanurate catalyst a quaternary ammonium carboxylate salt which comprises a compound falling within the following structural formula:

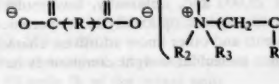


where R_1, R_2 and R_3 individually are radicals selected from the group consisting of alkyl, or substituted alkyl, R_4 is a radical substituted from the group consisting of alkyl, substituted alkyl or hydrogen, R is a radical selected from the group consisting of $-CH_2-_x$,

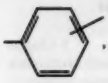


and x is a number of from 0 to 20 and n is a number of from 1 to 4.

10. A polyisocyanurate catalyst compound having a structural formula as follows:



where R_1, R_2 and R_3 individually are radicals selected from the group consisting of alkyl, or substituted alkyl, R_4 is a radical substituted from the group consisting of alkyl, substituted alkyl or hydrogen, R is a radical selected from the group consisting of $-CH_2-_x$,



, $-CH_2OCH_2-$, $-CH=CH-$, $-C\equiv C-$,

and

and x is a number of from 0 to 20 and n is a number of from 1 to 4.

4,186,256

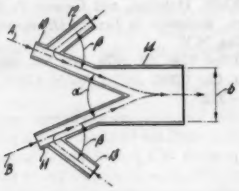
PROCESS AND APPARATUS FOR MIXING VISCOUS LIQUIDS

Howard F. Geise, North Plainfield, N.J., assignor to Sealer Air Corporation, Saddle Brook, N.J.

Filed Feb. 10, 1977, Ser. No. 767,354

Int. Cl.[2] C08G *18/08, 18/14;* B01F *3/10, 13/02*

U.S. Cl. 521—155 **5 Claims**



1. The method of fluidizing and intermixing two viscous materials comprising the steps of forcing each viscous material through an individual conduit, injecting a gas under pressure into each conduit in a direction counter to the flow of the viscous material therein to fluidize and facilitate the flow thereof and then feeding said fluidized materials into a third conduit whereby said fluidized materials will be thoroughly intermixed one with the other and flow readily through the last said conduit.

4,186,257

PROCESS FOR THE PREPARATION OF NEW SEGMENTED POLYURETHANE RESINS DERIVED FROM BLOCK COPOLYMERS BEING LINKED TOGETHER THROUGH ESTER AND/OR URETHANE AND/OR UREA GROUPS

Johannes Blahak; Roland Gipp, both of Cologne; Kuno Wagner; Erwin Müller, both of Leverkusen; Jan Mazanek, Cologne, and Peter Haas, Haan, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

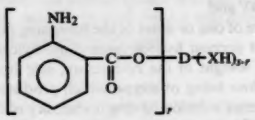
Filed Feb. 6, 1978, Ser. No. 875,646

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1977, 2706297; Oct. 4, 1977, 2744599

Int. Cl.[2] C08G *18/50*

U.S. Cl. 521—159 **11 Claims**

1. A process for the preparation of polyurethane resin, which may be cellular, comprising: reacting polyisocyanates, high molecular weight compounds having at least two isocyanate-reactive hydrogen atoms and a molecular weight of from about 500 to about 25,000 and, optionally, low molecular weight chain-lengthening agents, optionally in the presence of catalysts, blowing agents and other know additives, characterized in that the higher molecular weight compounds having isocyanate-reactive hydrogen atoms used comprise: block copolymers corresponding to the following general formula:

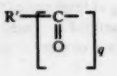


wherein

D represents an r-valent residue obtained by the removal of r hydroxyl and/or mercapto groups from a polyol or polythiol having s hydroxyl and/or mercapto groups, which residue is composed of from about 40 to about 85% by weight, of segments corresponding to the following general formula:

and from about 15 to about 60% by weight, based on the total weight of the segments, of segments corresponding to the following general formula:

the segments being linked together by residues corresponding to the following general formula:



;

X represents oxygen or sulfur;

s represents an integer of from 2 to 6;

r has an average value of from 0 to s;

A represents a n-valent residue obtained by the removal of n hydroxyl groups from a polyol having n hydroxyl groups, an average molecular weight of from about 500 to about 5000 and a melting point higher than 130° C.;

B represents an m-valent residue obtained by the removal of m hydroxyl groups and/or mercapto groups from a polyol or polythiol having m hydroxyl and/or mercapto groups, an average molecular weight of from about 500 to about 25,000 and a melting point below 60° C.;

R′ represents a q-valent residue obtained by the removal of q carboxyl groups from an aliphatic, cycloaliphatic or aromatic polycarboxylic acid having from 2 to 20 carbon atoms;

n represents 2 or 3;

m represents an integer of from 2 to 4; and

q which may be the same or different, represent 2 or 3.

4,186,258

SUBSTANTIALLY AMORPHOUS POLYOLEFINS USEFUL AS PRESSURE-SENSITIVE ADHESIVES

Robert R. Schmidt, III, and Jerry D. Holmes, both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 828,575, Aug. 29, 1977, Pat. No. 4,143,858. This application Nov. 2, 1978, Ser. No. 956,827

Int. Cl.[2] C08F *8/00, 8/42, 8/50*

U.S. Cl. 525—342 **2 Claims**

1. A process for preparing tacky modified amorphous polyolefin compositions useful as pressure-sensitive adhesives which comprises reacting substantially amorphous polyolefin having a melt viscosity of about 100 to 200,000 cp. at 190° C. with at least 1 weight percent of silica-alumina catalyst at a temperature of at least 250° C. to provide a low viscosity, permanently tacky hot-melt pressure-sensitive adhesive.

4,186,259

PROCESS FOR PRODUCING HOMOPOLYMERS OR COPOLYMERS OF VINYL OR VINYLIDENE HALIDES BY EMULSION POLYMERIZATION

Charles N. Bush, Bay Village, and Bela K. Mikofalvy, Avon Lake, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

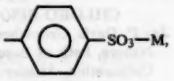
Filed Jul. 31, 1978, Ser. No. 929,863
Int. Cl.[2] C08F *2/24, 4/34, 14/06, 14/08*
U.S. Cl. 526—74 15 Claims

1. A process for producing polymers of vinyl and vinylidene halides and copolymers thereof with each other or either with one or more vinylidene monomers having at least one terminal $CH_2{=}C<$ grouping comprising forming a monomer premix containing the monomer or monomers to be polymerized, the aqueous reaction medium, from about 0.01% to about 0.5% by weight of a free-radical yielding catalyst based on the weight of 100 parts of monomer or monomers being polymerized, from about 0.0 to about 0.5 part of an ammonium salt of a saturated fatty acid containing from 8 to 20 carbon atoms, at least one long straight chain saturated alcohol containing from 14 to 24 carbon atoms, and from about 0.5 to about 1.25 parts of a sulfate or sulfonate type soap having the general formula

$$CH_3(C_nH_{2n})—X$$

wherein n is an integer from 7 to 17, X is selected from the group consisting of

$$—CH{=}CH—CH_2—Y;\quad —\underset{R}{CH}—CH_2—\underset{R}{CH}—Y \text{ and}$$



and wherein R is H, OH or an alkyl group containing from 1 to 4 carbon atoms; R is H, or an alkyl group containing from 1 to 4 carbon atoms; Y is $—SO_3—M$; $—O—SO_3—M$; or $—OCH_2CH_2—O—_mSO_3—M$, wherein M is selected from NH_4, Na and K, and m is an integer from 7 to 17, the ratio of alcohol to emulsifier is equal to or greater than 1.0, homogenizing said premix at a temperature below the reactivity of the catalyst or catalysts employed, passing said homogenized premix to a reaction zone, initially polymerizing said homogenized premix in said zone at a temperature in the range of 30° C. to 40° C., then continuing the polymerization in said zone at a temperature in the range of about 40° C. to about 65° C. until complete, maintaining the pH in the reaction zone in the range of about 7.0 to about 12.0 throughout the polymerization reaction period, and thereafter recovering the polymer or copolymer latex or slurry and spray drying the same, whereby polymers and copolymers having improved plastisol foam properties are produced and polymer buildup in said reaction zone is substantially reduced.

4,186,260

OLEFIN POLYMERIZATION PROCESS

Richard E. Dietz, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 792,732, May 2, 1977, Pat. No. 4,119,569, which is a continuation of Ser. No. 363,482, May 24, 1973, abandoned, which is a division of Ser. No. 89,047, Nov. 12, 1970, abandoned. This application Aug. 1, 1978, Ser. No. 930,081
The portion of the term of this patent subsequent to Jun. 3, 1992, has been disclaimed.
Int. Cl.[2] C08F *4/02, 4/78, 10/02, 10/08*
U.S. Cl. 526—106 13 Claims

1. A method for polymerizing at least one 1-olefin which comprises contacting said olefin with a catalyst prepared by

a. combining a titanium compound and a mineral acid;

b. introducing an alkali metal silicate into the acid containing said titanium compound to form a hydrogel;

c. aging the hydrogel for a time of greater than one hour;

d. washing the thus aged hydrogel to produce a substantially alkali metal-free hydrogel;

e. forming a mixture comprising the thus washed hydrogel and a normally liquid oxygen-containing, water soluble organic compound;

f. separating said organic compound and water from said mixture to form a xerogel; and,

g. heating said xerogel also containing chromium at a temperature of 900° to 1800° F.

4,186,261

ELASTOMERIC POLYURETHANE COMPOSITIONS AND SEALS

Raymond E. Sprey, Manchester, N.H., assignor to Disogrin Industries Corporation, Manchester, N.H.

Continuation of Ser. No. 757,095, Jan. 5, 1977, abandoned. This application Jun. 5, 1978, Ser. No. 912,836
Int. Cl.[2] C08G *18/67, 18/76;* B65D *53/06*
U.S. Cl. 528—75 10 Claims

1. An elastomeric polyurethane composition resistant to fluids containing phosphate esters; comprising the reaction product of:

(a) 3,3'-dimethyl-4,4'-diphenyl diisocyanate;

(b) a polyhydroxy compound selected from the group consisting of polycaprolactone polyols; and

(c) a chain extender including an amount which is effective to provide resistance to fluids containing phosphate casters of a linear aliphatic compound defining a chain of carbon atoms, each end of the chain being attached to a hydroxyl group, and the chain having an unsaturated carbon-carbon bond.

8. In a hydraulic machine comprising: a fluid container, a hydraulic fluid containing a phosphate ester, and elastomeric means for sealing the container; the improvement consisting of elastomeric means for sealing the container made of a polyurethane composition resistant to hydraulic fluids containing a phosphate ester, the polyurethane composition comprising the reaction product of:

(a) 3,3'-dimethyl-4,4'-diphenyl diisocyanate;

(b) a polyhydroxy compound selected from the group consisting of polycaprolactone polyols; and

(c) a chain extender including an amount which is effective to provide resistance to fluids containing phosphate casters of a linear aliphatic compound defining a chain of carbon atoms, each end of the chain being attached to a hydroxyl group, and the chain having an unsaturated carbon-carbon bond.

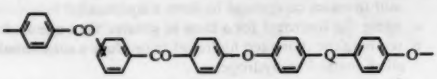
4,186,262

AROMATIC POLYMERS HAVING PHENYLENE GROUPS LINKED BY OXYGEN ATOMS, KETO GROUPS AND SULPHONE GROUPS

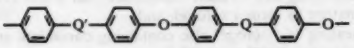
John L. Freeman, St. Neots, and John B. Rose, Letchworth, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 767,332, Feb. 10, 1977, now Defensive Publication No. T 966,006. This application Jan. 23, 1979, Ser. No. 5,824
Claims priority, application United Kingdom, Feb. 10, 1976, 5173/76
Int. Cl.[2] C08G *65/40, 75/23*
U.S. Cl. 528—125 8 Claims

1. An aromatic etherketone/sulphone copolymer containing 40 to 90 mole % of the repeat units



and correspondingly 10 to 60 mole % of the repeat units



where Q and Q′ are selected from —SO_2— and —CO—, the number of —SO_2— groups being 3 to 25% of the total number of —SO_2— and —CO— groups.

4,186,263

INJECTION MOLDABLE AMIDE-IMIDE TERPOLYMERS CONTAINING DIVALENT AROMATIC QUINONE RADICALS

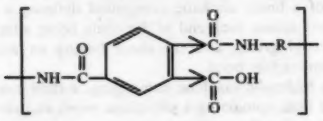
Edwin F. Morello, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 29, 1978, Ser. No. 947,087

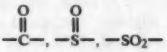
Int. Cl.[2] C08G *73/10, 73/16*

U.S. Cl. 528—128 **19 Claims**

1. An injection moldable polyamide terpolymer capable of undergoing imidization consisting essentially of the following recurring structures containing amido linkages:



wherein an arrow denotes isomerism and wherein R consists essentially of R_1, R_2, R_3 and R_4 and R_1 is a divalent aromatic quinone radical containing at least two aromatic rings having from 14 to 26 carbon atoms, R_2 and R_3 are different and are divalent aromatic hydrocarbon radicals of from 6 to 10 carbon atoms joined directly or by stable linkages consisting of —O—, methylene,



and —S— radicals, and R_4 is a saturated alkylene radical of from 2 to 10 carbon atoms and wherein the mole ratio of the R_1 containing units to the sum of the R_2, R_3 and R_4 containing units is about 1:99 to about 1:9.

4,186,264

TRIAZAPENTADIENES AS ACARICIDES

Alexander B. Penrose, Tilmanstone, Nr. Deal, and Michael R. G. Leeming, Canterbury, both of England, assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 787,084, Apr. 13, 1977, Pat. No. 4,128,652.

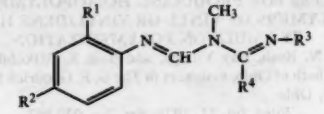
This application Sep. 18, 1978, Ser. No. 943,665

Claims priority, application United Kingdom, Apr. 20, 1976, 15812/76; Aug. 18, 1976, 34319/76

Int. Cl.[2] A01N *9/12;* **C07D** *275/02, 275/04*

U.S. Cl. 424—270 **8 Claims**

1. A triazapentadiene of the formula:



and the acaricidally acceptable acid addition salts thereof, wherein

R^1 is alkyl of 1 to 4 carbon atoms;

R^2 is selected from the group consisting of hydrogen, chlorine, bromine, fluorine, iodine and alkyl of 1 to 4 carbon atoms;

R^3 is benzothiazolyl or thiazolyl optionally containing one or two substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxycarbonyl containing 1 to 4 carbon atoms in the alkoxy moiety and unsubstituted phenyl; and

R^4 is hydrogen or alkyl of 1 to 4 carbon atoms.

4,186,265

SEPARATION OF A TRIS(ALKYLAMINO)-S-TRIAZINE BY-PRODUCT FROM CHLORO-BIS(ALKYLAMINO)-S-TRIAZINES

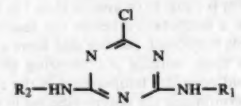
Jay P. Davis, Greensboro, N.C.; Henry C. Grace, and James B. Nabors, both of Baton Rouge, La., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 20, 1978, Ser. No. 971,574

Int. Cl.[2] C07D *251/50*

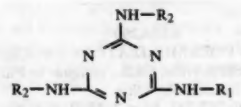
U.S. Cl. 544—204 **10 Claims**

1. In a process for the production of a chloro-bis(alkylamino)-s-triazine compound having the structural formula



(I)

in which R_1 and R_2 independently represent lower alkyl of 1 to 4 carbon atoms or cycloalkyl of 3 to 6 carbon atoms, in which a water-immiscible organic process stream is obtained comprising one compound of the formula defined above in a water-immiscible solvent and a tris(alkylamino)-s-triazine by-product of the structural formula



(II)

wherein R_1 and R_2 have the meaning as defined under structural formula (I) as impurity, the improvement which comprises separating said tris(alkylamino)-s-triazine by-product from said water-immiscible organic process stream by treating said organic process stream with an aqueous acid solution in the pH-range of 5.4 to 0.5 and leaving all of the chloro-bis(alkylamino)-s-triazine product of the structural formula (I) in the organic process stream in a purified state and essentially free of an undesirable compound of the structural formula (II).

4,186,266

PROCESS FOR PRODUCING 5-FLUOROURACIL

Akihiro Yamazaki, Yokosuka; Hirokazu Morisawa, Kawasaki; Yoshio Oda, Yokohama, and Keiichi Uchida, Kawasaki, all of Japan, assignors to Asahi Glass Company Limited and Ajinomoto Company Incorporated, both of Tokyo, Japan

Filed Jun. 7, 1978, Ser. No. 913,333
Claims priority, application Japan, Jun. 17, 1977, 52-70981
Int. Cl.[2] C07D *239/54*
U.S. Cl. 544—313 11 Claims

1. A process for producing 5-fluorouracil in high yield and of high purity from orotic acid, which comprises reacting orotic acid with a fluorinating agent to form 5-fluoro-orotic acid, separating any unreacted orotic acid, and then heating the 5-fluoro-orotic acid to decarboxylate it and obtain 5-fluorouracil.

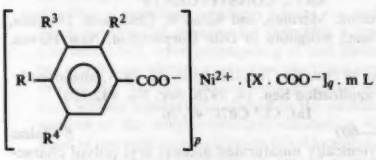
4,186,267

NICKEL STABILIZERS FOR SYNTHETIC POLYMERS

Michael Rasberger, Allschwil; Jean Rody, Basel; Paul Moser, Riehen, and Helmut Muller, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 663,332, Mar. 3, 1976, Pat. No. 4,046,788, which is a division of Ser. No. 491,978, Jul. 26, 1974, Pat. No. 3,948,852. This application Aug. 24, 1977, Ser. No. 827,293
Claims priority, application Switzerland, Aug. 7, 1973, 11407/73; Jan. 28, 1974, 1103/74
Int. Cl.[2] C07F *15/04*
U.S. Cl. 546—11 7 Claims

1. Compounds of the formula I



(I)

wherein either R^1 is hydroxyl and R^2 is hydrogen or R^1 is hydrogen and R^2 is hydroxyl, R^3 and R^4 are hydrogen or alkyl with 1–5 C atoms, either p is 1 and q is 1 or p is 2 and q is zero, X is optionally mono hydroxyl-substituted alkyl, cycloalkyl, phenyl, alkaphenyl, or phenylalkyl, m is a value from 1–2 and, n represents a value from 0 to 2 and L denotes a ligand R^5—N(R^6)—R^7, wherein R^5 and R^6 together with the N atom form a pyrrolidine, or piperidine ring which is substituted by alkyl groups or is unsubstituted and R^7 is H, alkyl or phenylalkyl.

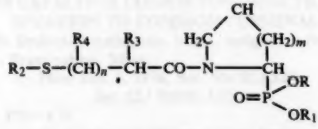
4,186,268

MERCAPTOACYLPYRROLIDINE PHOSPHONIC ACIDS AND RELATED COMPOUNDS

Edward W. Petrillo, Jr., Pennington, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

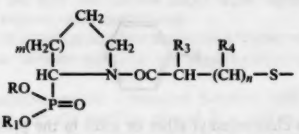
Filed Jan. 29, 1979, Ser. No. 7,131
Int. Cl.[2] C07D *211/36, 207/10, 207/46, 211/92*
U.S. Cl. 546—21 20 Claims

1. A compound of the formula



wherein R and R_1 each is hydrogen, lower alkyl, phenyl-lower alkyl or an alkali metal ion;

R_2 is hydrogen, lower alkanoyl, benzoyl or



R_3 and R_4 each is hydrogen or lower alkyl;
m is 1 or 2; and
n is 0 or 1.

3. A compound as in claim 1 wherein m is 2.

4,186,269

PROCESS FOR PRODUCING AN AROMATIC URETHANE

Yutaka Hirai; Katsuharu Miyate, and Makoto Aiga, all of Omuta, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Dec. 31, 1975, Ser. No. 645,712
Claims priority, application Japan, Jan. 30, 1975, 50-11891; Jul. 30, 1975, 50-91987; Aug. 14, 1975, 50-98081
Int. Cl.[2] C07C *125/06*
U.S. Cl. 560—25 9 Claims

1. A process for producing an aromatic urethane comprising interacting an aromatic nitro compound selected from the group consisting of nitroaromatic hydrocarbons, halogenated nitroaromatic hydrocarbons and bis (nitrophenyl)ethers, a hydroxyl group-containing organic compound selected from the group consisting of a monohydric alcohol, a polyhydric alcohol, a monohydric phenol and a polyhydric phenol and carbon monoxide in a reactor under an initial carbon monoxide pressure of 10–500 kg/cm^2 and a temperature of 80°–260° C. in the presence of a catalyst composed of (1) a member selected from the group consisting of the metals palladium, ruthenium and rhodium and a catalytically active compound thereof selected from the group consisting of the halide, cyanide, thiocyanide, isocyanide, oxide, sulfate, nitrate, and carbonyl compounds of said metals, the complex salt of said halide with a tertiary amine, and the complex salt of said halide with triphenylphosphine, (2) a Lewis acid, and (3) a tertiary amine which suppresses corrosion of the reactor material by the Lewis acid and which forms an insoluble solid with said member and said Lewis acid, the molar ratio of said tertiary amine to the anions of said Lewis acid being in the range of 0.5 to 5.

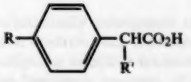
4,186,270

PROCESS FOR MAKING 2-(4-ISOBUTYLPHENYL)PROPIONIC ACID AND RELATED COMPOUNDS

William Dowd, and David H. Naffziger, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

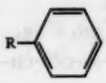
Filed Dec. 26, 1978, Ser. No. 973,206
Int. Cl.[2] C07C *63/33, 63/52*
U.S. Cl. 562—496 11 Claims

1. A process for making a comound having the formula

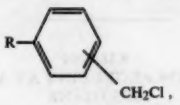


wherein R is hydrogen, an alkyl radical of 1–7 carbon atoms, or a cycloalkyl radical of 5–7 carbon atoms and R' is methyl or ethyl which comprises

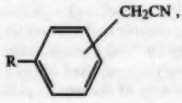
(a) reacting a compound of the formula



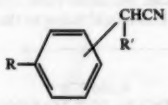
with a chloromethyl ether or ester in the presence of a solvent under chloromethylating conditions, thereby forming a solvent solution of the benzyl chloride



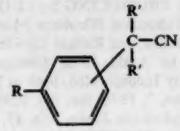
(b) reacting said solution with at least about one molar equivalent of an aqueous solution of metal cyanide per mole of the benzyl chloride at about 60° C.–100° C. in the presence of a solubilizing amount of a phase-transfer catalyst, thereby producing an organic layer consisting essentially of the corresponding phenylacetonitrile and solvent and an aqueous layer containine dissolved inorganic salts, separating said organic layer, and distilling therefrom essentially all of the solvent to form a distillation residue of the crude phehylacetonitrile



(c) reacting said crude phenylacetonitrile with about 0.8–1.5 molar equivalents of R'X or R'$_2$SO$_4$ wherein X is halogen in the presence of excess alkali metal hydroxide at about 0° C.–70° C., thereby producing a reaction mixture consisting essentially of the monoalkylated nitrile

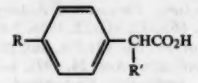


and minor proportions of the unreacted phenylacetonitrile and the dialkylated nitrile



(d) reacting said reaction mixture at about 20° C.–60° C. with at least about one mole er mole of the unreacted phenylacetonitrile of an aldehyde of the formula R"CHO wherein R" is a hydrocarbon radical of 2–7 carbon atoms, water-washing the reacted mixture essentially free of inorganic salts, and

(e) reacting the washed mixture at about 100° C.–120° C. for about 1–15 hours with at least about one mole of about 60–80 percent aqueous H_2SO_4 per mole of total nitrile in the presence of sufficient acetic acid to make a homogeneous solution, and separating



from the thereby formed hydrolysis product.

4,186,271

UNSATURATED POLYOLS CONTAINING ALKENYL ARYL CONSTITUENTS

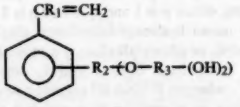
Frank J. Preston, Meriden, and Kiran B. Chandalia, Hamden, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 783,355, Mar. 31, 1977, abandoned. This application Sep. 14, 1978, Ser. No. 942,220

Int. Cl.^{2} C07C *43/20*

U.S. Cl. 568—607 **5 Claims**

1. An ethylenically unsaturated alkenyl aryl polyol characterized by the formula:



wherein

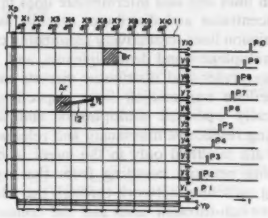
R_1 is hydrogen or methyl;

R_2 represents a lower alkylene radical of 1–4 carbons; and —O—R_3—$(OH)_2$) represents a residue of a polyether polyol, $R_3(OH)_3$, wherein R_3 represents a polyether chain, with an equivalent weight ranging from 1000 to 1500, after removal of one hydroxy hydrogen therefrom.

4,186,272
CODE GENERATOR

Toshihiko Kobayashi, Musashino, and Tetsusaburo Kamibayashi, Niza, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Apr. 7, 1978, Ser. No. 894,518
Claims priority, application Japan, Apr. 11, 1977, 52-40301
Int. Cl.[2] G08C 21/00
U.S. Cl. 178—19 8 Claims



1. A code generator, comprising:

a magnetostrictive plate-like member composed of magnetostrictive material for propagating therein magnetostrictive oscillation waves;

at least one excitation winding wound on said magnetostrictive plate-like member and receiving in use an electrical signal for exciting a magnetostrictive oscillation wave which propagates in said magnetostrictive plate-like member in a direction of propagation;

a plurality of detecting windings wound on said magnetostrictive plate-like member for detecting a magnetostrictive oscillation wave propagating in said plate-like member and for developing respective electrical output signals in response thereto, wherein said detecting windings are each wound substantially normal to the direction of propagation of the magnetostrictive oscillation wave developed in response to energization of said excitation winding and said detecting windings are spaced at intervals along the direction of propagation for defining areas bounded by successive ones of said detecting windings and for successively developing respective electrical output signals in response to propagation of the magnetostrictive oscillation wave in the direction of propagation;

positionable detection means positionable at any selected one of the areas defined between successive ones of said detecting windings for detecting a magnetostrictive oscillation wave propagating in said plate-like member and through the selected area at which said positionable detection means is positioned and for developing an output signal in response to the detected magnetostrictive oscillation wave; and

coding means responsive to the output signal of said positionable detection means and to the respective output signals of said detecting windings for developing a unique code signal corresponding to the selected area at which said positionable detection means is positioned.

4,186,273
STEREOPHONIC SYSTEM HAVING POWER AMPLIFIERS AND SPEAKERS IN A BRIDGE CIRCUIT WITH CAPACITOR CONNECTING JUNCTION OF SPEAKERS TO COMMON TERMINAL

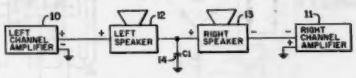
George B. Dodson, Framingham, Mass., assignor to Bose Corporation, Framingham, Mass.

Filed Jun. 5, 1978, Ser. No. 912,323
Int. Cl.[2] H04R 5/04
U.S. Cl. 179—1 G 4 Claims

1. In a stereo power amplifying system having a common terminal, first and second loudspeaker means for providing first and second sound signals representative of first and second audio input signals representative of first and second audio input signals and first and second power amplifying means for amplifying the first and second audio input signals respectively, the improvement comprising,

means intercoupling said first and second loudspeaker means in series between said first and second power amplifying means,

and capacitive means connected between said common terminal and the junction of said first and second loudspeaker means for blocking D.C. while allowing spectral components representative of said first and second audio input signals to pass through said capacitive means to said common terminal through said first and second loud-



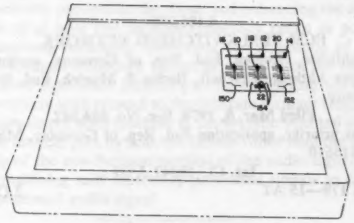
speaker means respectively above a predetermined crossover frequency determined by the value of said capacitive means and the impedance of said first and second loudspeaker means while preventing D. C. from flowing through said first and second loudspeaker means,

said first and second loudspeaker means being intercoupled for radiating acoustical energy in phase of spectral components present in said first and second audio input signals in a frequency range below said crossover frequency in which frequency range the signals provided by said first and second power amplifying means are in phase opposition.

4,186,274
SOUND SYSTEM CONTROL

Andrew G. Mayshar, Shrewsbury, Mass., assignor to Bose Corporation, Framingham, Mass.

Filed Jun. 22, 1978, Ser. No. 917,874
Int. Cl.[2] H03G 9/00
U.S. Cl. 179—1 D 5 Claims



1. In a sound amplification system having a plurality of frequency selective transmission channels with means for controlling the frequency response and gain of each selective transmission channel an improved control panel arrangement comprising,

a plurality of substantially contiguous colinear slider frequency response controls each associated with respective frequency contiguous selective transmission channels for controlling the frequency response of a respective channel,

and a corresponding plurality of linear slider controls each adjacent and perpendicular to a respective frequency response control for controlling the gain in the channel associated with the adjacent frequency response control.

4,186,275

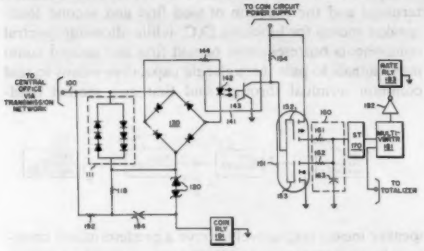
INITIAL RATE OVERRIDE CIRCUIT

Robert V. Burns, Tinley Park, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Aug. 2, 1978, Ser. No. 930,304

Int. Cl.[2] H04M *17/02*

U.S. Cl. 179—6.3 R **14 Claims**



1. An initial rate override circuit for use in a coin telephone, including a coin control circuit connectable in series through an initial rate deposit circuit and a first current limiting means, to a telephone central office, said initial rate override circuit comprising:

voltage control means connected in parallel with said first current limiting means;

first isolation means connected between said voltage control means and said coin control circuit, operated in response to an application of coin battery to said coin telephone by said central office to provide continuity between said voltage control means and said coin control circuit, allowing current to flow through said voltage control means; said voltage control means operated in response to said current flow; and

switching means connected between said voltage control means and said initial rate deposit circuit, operated in response to operation of said voltage control means, to operate said initial rate deposit circuit to connect said coin control circuit to said central office via said first current limiting means.

4,186,276

PCM TDM SWITCHING NETWORK

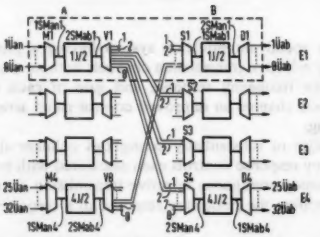
Max Schlichte, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 8, 1978, Ser. No. 884,582

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1977, 2713610

Int. Cl.[2] H04J *3/00*

U.S. Cl. 179—15 AT **2 Claims**



1. A pulse code modulation, time division multiplex switching network, in a time-spaced-time structure, comprising:

a plurality of time division multiplex transmission lines and intermediate time division multiplex transmission lines;

a plurality of switch-through units interconnected by said transmission lines and operable to provide both time and spatial assignment of time channels seized on incoming transmission lines to time channels seized on outgoing transmission lines by time slot conversion; and

a plurality of concentrator circuits and a plurality of distributor circuits connecting said time division multiplex transmission lines and said intermediate lines in groups;

said concentrator and distributor circuits assigned to said transmission lines respectively comprising cyclically operated multiplexers and demultiplexers, and

said concentrator and distributor circuits assigned to said intermediate transmission lines respectively comprising acyclically operated multiplexers and demultiplexers, including respective interlacing and release arrangements which are modified only in the event of changes to the switching network resulting from the expansion of an existing switching network through the addition of additional switch-through units and the connection of additional time multiplex lines.

4,186,277

TIME DIVISION MULTIPLEX TELECOMMUNICATIONS SWITCHING NETWORK

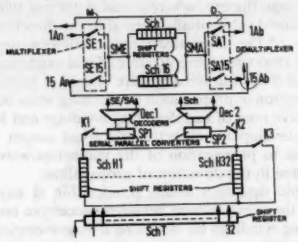
Max Schlichte, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 759,272, Jan. 14, 1977, abandoned. This application May 23, 1978, Ser. No. 908,636

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1976, 2602561

Int. Cl.[2] H04Q *11/04*

U.S. Cl. 179—15 AT **7 Claims**



1. A time division multiplex (TDM) switching network not operating with freedom from congestion comprising:

a first plurality of TDM lines forming a first trunk groups and a second plurality of TDM lines forming second trunk groups, said first and second trunk groups being arranged to form, respectively, the rows and columns of a switching matrix, and

at least one switching network unit means, arranged at each crosspoint of a first and second trunk group for forming connections between lines in said first and second trunk groups and between lines in said first and between lines of said second trunk groups, for causing connections on TDM lines connected thereto to be assigned on a space division basis and on a time division basis.

4,186,278

END-OF-KEYING CONTROL CIRCUIT

James R. Ballard, Pickerington, Ohio, assignor to Western Electric Company, New York, N.Y.

Filed May 30, 1978, Ser. No. 910,191

Int. Cl.[2] H04Q *1/50, 3/47*

U.S. Cl. 179—18 ET **12 Claims**

1. An end-of-keying control circuit for a TOUCH-TONE

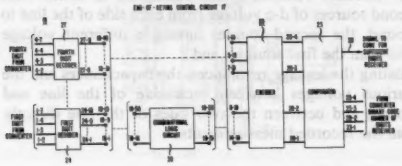
signal to dial pulse converter arrangement suitable for use on a call in a communication switching system having

a plurality of converters (13, 14) for converting into dial pulses the TOUCH-TONE digits received on said call,

a common translator (16) time shared by each of said converters (13, 14), and

circuitry (15) successively connecting each one of said converters (13, 14) individually to said translator (16) during an assigned individual one of a plurality of repetitive time slots,

characterized in that



said translator (16) comprises said end-of-keying control circuit (17) responsive to a receipt from the time slot connected one of said converters (13, 14) of first input signals representing the numerical value of each one and more of said TOUCH-TONE digits and of second input signals representing the actual number of said TOUCH-TONE digits received by said connected one of said converters (13, 14) for generating an end-of-keying control signal to indicate when the total expected number of said TOUCH-TONE digits have been received by said connected one of said converters (13, 14).

4,186,279

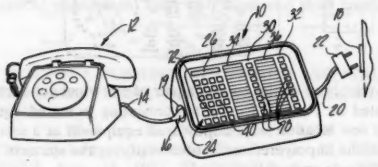
STORED PROGRAM TELEPHONE DIALER

William W. Face, Saline, Mich., assignor to Microelectronic Communications Corporation, Madison Heights, Mich.

Filed Mar. 29, 1978, Ser. No. 891,212

Int. Cl.[2] H04M *1/45*

U.S. Cl. 179—90 B **5 Claims**



1. A device adapted to be connected to a telephone line in association with a telephone transceiver to generate any one of a plurality of telephone station addressing signals, comprising:

a station addressing signal generator;

a plurality of alterable digital registers, each adapted to store an entire station address code;

a number index containing a plurality of discrete areas each associated with one of said registers and being adapted to display a station address, the display areas being arrayed in linear relation to one another;

a memory locator grid containing a plurality of windows equal in number to a divisor of the number of display areas on the index, the grid being slidably supported for movement relative to the index, along the linear axis of the display areas, between a number of positions equal to said divisor; and

switch means supported relative to the index and the grid operative to control the interconnection of the signal generator with one of said registers which is associated with one of the areas on the index forming a member of the subset in operative relation with the grid, whereby the address signal generated by the device is a function of the relative position of the index and the grid.

4,186,280

METHOD AND APPARATUS FOR RESTORING AGED SOUND RECORDINGS

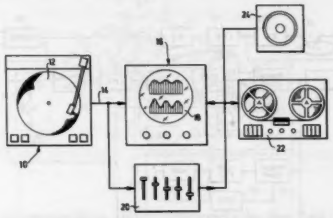
Wolfgang Geiseler, Berlin, Fed. Rep. of Germany, assignor to CMB Colonia Management-und Beratungsgesellschaft mbH & Co. KG, Cologne, Fed. Rep. of Germany

Filed Apr. 27, 1977, Ser. No. 791,573

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1976, 2618973

Int. Cl.[2] G11B *5/04;* G10H *1/02*

U.S. Cl. 179—100.1 R **9 Claims**



1. A method for preparing a restored sound version from an old sound recording having at least one significant musical part forming at least one of: singing voice; solo instrument; predominant instrumental group; said significant musical part having a formant character, comprising

playing back the old sound recording;

generating an electric audio signal;

frequency-selectively processing the electric audio signal in a circuit arrangement with a preestablished frequency response;

enhancing the amplitude of at least one formant frequency range or portion of a specific selected significant musical part of the audio signal by amplifying said at least one formant frequency range or part and corresponding to said selected significant musical part by a factor other than the amplitude of a non-formant portion of the audio signal corresponding to said musical part, said steps of frequency selectively processing the signal and enhancing the amplitude of at least one formant frequency range or portion comprising separately enhancing the amplitude of separate formant frequency ranges or portions of the specific selected significant musical part by amplifying the signal selectively with respect to the separate formant frequency ranges or portions inherent in the specific selected significant musical part by selected factors other than the amplitude of the non-formant portion of the audio signal;

and combining said separately processed signals to form a regenerated audio signal.

4,186,281

MULTICHANNEL RECORD DISC REPRODUCING APPARATUS

Masao Kasuga, Sagamihara; Nobuaki Takahashi, Yamato; Fujio Suzuki, and Yoshiki Iwasaki, both of Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Oct. 20, 1977, Ser. No. 843,863

Claims priority, application Japan, Oct. 22, 1976, 51-126929; Nov. 25, 1976, 51-141700

Int. Cl.[2] G11B *3/00;* H03D *3/00*

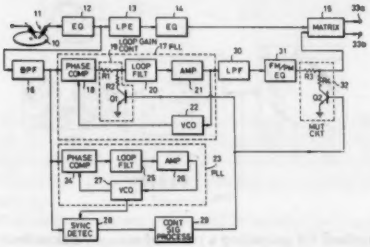
U.S. Cl. 179—100.4 ST **8 Claims**

1. A multichannel record disc reproducing apparatus comprising:

first phase locked loop circuit means including phase com-

parator means and voltage controlled oscillator means for demodulating an angle-modulated wave signal which is separated from a signal picked up from a multichannel record disc on which a direct wave signal and an angle-modulated wave signal are recorded in a multiplexed state, the output of said first phase locked loop circuit means being a demodulated signal, said first phase locked loop circuit means having a maximum lock range width which is the same as or slightly wider than the frequency band of the angle-modulated wave signal;

second phase locked loop circuit means including phase comparator means and voltage controlled oscillator means, said second phase locked loop circuit means being supplied with said separated angle-modulated wave signal and having a lock range with a width which covers and is



wider than the maximum lock range width of the first phase locked loop circuit means;

synchronous detector means for comparing the phases of said angle-modulated wave signal and the output signal of said voltage controlled oscillator means of said second phase locked loop circuit means and operating when the phase difference of said two signals deviates from a predetermined phase difference to produce an output in accordance with the deviation of the phase difference; and

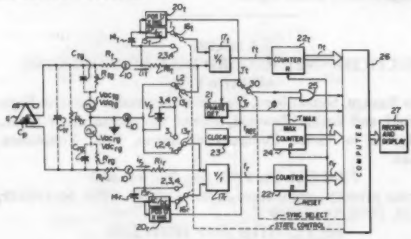
means for reducing or removing noise components which are developed in the demodulated signal in accordance with the output of said synchronous detector means, said reducing or removing means being in the first phase locked loop circuit means or in a channel for transmitting the demodulated signal.

4,186,282

METHOD AND APPARATUS FOR MEASURING TELEPHONE LINE CHARACTERISTICS

John C. Ellson, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sep. 25, 1978, Ser. No. 945,246
Int. Cl.[2] H04B 3/46
U.S. Cl. 179—175.3 R **5 Claims**



1. A machine method of measuring the leakage resistances, the capacitances, and the spurious voltages on a telephone line comprising the steps of:

individually measuring and recording any spurious current flowing through individual reference resistors connected from each side of the line to ground;

individually measuring and recording the transient charge and the steady state current flowing through the individual reference resistors when connected in series with first sources of d-c voltage from each side of the line to ground;

individually measuring and recording the transient charge and the steady state current flowing through the individual reference resistors when connected in series with second sources of d-c voltage from each side of the line to ground, the second sources having a different voltage ratio than the first sources; and

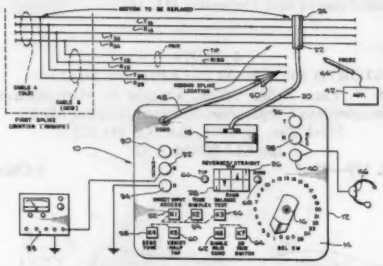
calculating the leakage resistances, the capacitances and the spurious voltages between each side of the line and ground, and between the two sides of the line directly from the recorded measurements.

4,186,283

TEST SET

James F. Simmonds, Woodland Hills, Calif., assignor to Perkins Research & Manufacturing Co., Inc., Canoga Park, Calif.

Filed May 22, 1978, Ser. No. 908,055
Int. Cl.[2] H04B 3/46
U.S. Cl. 179—175.3 R **49 Claims**



1. In telephone cables having a pair of electrical conductors designated as Tip and Ring interconnecting powered equipment at one location with unpowered equipment at a second location, the unpowered test set for verifying the status of the Tip/Ring pair comprising:

(a) a low-resistance high-impedance circuit;

(b) means for selectively electrically connecting and disconnecting said low-resistance high-impedance circuit in parallel with the Tip/Ring pair whereby interference with normal operation of the equipment interconnected by the Tip/Ring pair during verification testing is prevented;

(c) a pair of matched circuits adapted for electrically connecting between the Tip conductor and ground potential and between the Ring conductor and ground potential respectively, each of said pair of matched circuits including one of a pair of matched voltage indicating meters respectively whereby the status of the Tip/Ring pair is indicated by the respective voltages with respect to ground potential; and,

(d) means for electrically connecting said pair of matched circuits after said low-resistance high-impedance circuit has been electrically connected and for electrically disconnecting said pair of matched circuits before said low-resistance high-impedance circuit has been electrically disconnected.

4,186,284

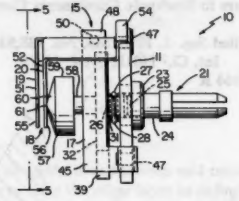
ELECTRICAL SWITCH ASSEMBLY HAVING ROTARY AND AXIALLY OPERATED SWITCHES

Robert Strachan, Wolcott, Conn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Feb. 27, 1978, Ser. No. 881,530

Int. Cl.[2] H01H *9/00, 3/42*

U.S. Cl. 200—1 A **2 Claims**



1. In an electrical switch construction having a frame means carrying two pairs of cooperable contact means, each pair of contact means comprising a pair of switch blades carried by said frame means and having free ends that are normally spaced from each other by the natural bias of said blades, a movable manipulator means being carried by said frame means and comprising a shaft that is rotatable in said frame means and extends between said two pairs of switch blades to be adjacent one blade of each pair thereof, a cam member being carried by said shaft and being engageable with said one of said blades of each pair thereof to urge said free end thereof into contact with said free end of the other blade of that respective pair when said shaft is rotated in a certain direction a certain amount, the improvement wherein said cam member has a generally rectangular profile defined by four corners thereof that are disposed transverse to said shaft, two of said corners being generally right angle corners and the other two corners being generally rounded corners, said right angle corners being respectively adjacent said one of said blades of each said pair thereof for engagement therewith, said rounded corners being respectively adjacent said one of said blades of each said pair thereof to prevent engagement therewith when said shaft is rotated.

4,186,285

MULTIPLE PUSHBUTTON SWITCH ASSEMBLY

Yoshito Tanaka, Tokyo, Japan, assignor to Toko Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1978, Ser. No. 897,638

Claims priority, application Japan, Apr. 20, 1977, 52-50059[U]; Aug. 18, 1977, 52-109562[U]; Sep. 2, 1977, 52-118252[U]

Int. Cl.[2] H10H *9/26;* H01H *15/00*

U.S. Cl. 200—5 E **2 Claims**

1. A multiple pushbutton switch assembly which comprises:

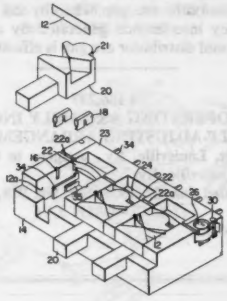
(a) a casing having a plurality of slider accomodating recesses therein and restoring member accomodating grooves in a straight line connecting said plurality of recesses and having a rear plate fitted onto the rear side of said housing;

(b) a plurality of sliders slidably mounted in corresponding ones of said plurality of slider accomodating recesses, each slider having a contact receiving recess in the one sliding surface and a leaf spring receiving recess in the opposite surface;

(c) a plurality of movable contacts, one in each of said contact receiving recesses in the one sliding surfaces of said sliders, each movable contact having a U-shaped cross-section and a contact section formed by two opposed inner wall surfaces thereof;

(d) a plurality of pairs of stationary contacts in said casing and having a portion of the contacts of each pair projecting into a corresponding slider accomodating recess for being engaged by and connected electrically to each other by said movable contacts when the corresponding slider is in one position in the slider accomodating recess and being disconnected when the corresponding slider is in a second position;

(e) a leaf spring means in the leaf spring receiving recess in each of said sliders, each leaf spring in a bent state with the opposite ends thereof fixed in said casing and with the central part thereof engaged with said slider for holding



the corresponding slider alternately in the first position and the second position in said casing; and

(f) a restoring member extending through said restoring member accomodating grooves in said casing and being contacted by one end of each of said sliders and with the opposite ends fixedly secured to said casing and having an amount of slack for causing said restoring member to be in contact with all of said sliders and permitting the depression of only one slider.

4,186,286

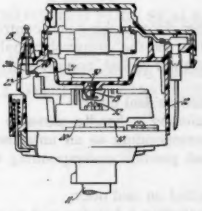
RADIO FREQUENCY INTERFERENCE SUPPRESSING IGNITION DISTRIBUTOR ROTOR

Wey-Chaung Kuo, Bloomfield Hills, and Hwei P. Hsu, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 848,243, Nov. 3, 1977, abandoned. This application Oct. 10, 1978, Ser. No. 950,048

Int. Cl.[2] H01H *19/00;* F02P *1/00*

U.S. Cl. 200—19 DR **4 Claims**



1. A radio frequency interference suppressing ignition distributor rotor of the type adapted to be rotated about its axis within a distributor cap having a plurality of output terminals circumferentially disposed about the rotor axis of rotation comprising: a body member of an electrical insulating material rotatable about an axis of rotation; a rotor segment of an electrically conductive material supported by said body member and having at least top and bottom flat face surfaces that define, at the extremities thereof nearest said output terminals, the top and bottom edge boundaries of an output tip surface that extends substantially parallel to said axis of rotation of said

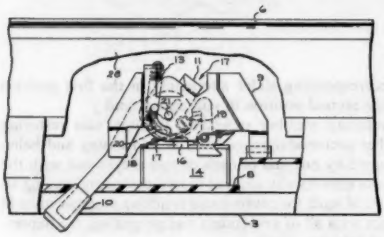
body member and which, while said rotor segment is rotated with said body member, traces a circular path radially inwardly from said circumferentially disposed distributor cap output terminals by a predetermined distributor arc gap; and a layer of silicone rubber dielectric material secured to at least one of said rotor segment top and bottom flat face surfaces and so located that the terminating edge thereof nearest said output tip surface is within a range of 0" to 0.040" radially inwardly from the edge boundary of said output tip surface, said silicone rubber layer being effective to reduce the breakdown potential across said distributor arc gap whereby the radiation of the radio frequency interference generated by an electrical discharge across said distributor arc gap is effectively suppressed.

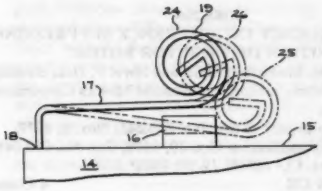
4,186,287

SWITCH OPERATING ASSEMBLY INCLUDING A SELF-ADJUSTING ARRANGEMENT

Allen W. Scott, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jun. 22, 1978, Ser. No. 918,176
Int. Cl.[2] H01H *3/16*
U.S. Cl. 200—61.62 **6 Claims**





5. A dishwasher door latching and control arrangement for enabling operation of the dishwasher only when the dishwasher door is tightly closed, comprising:

a door;

a latch mounted on said door;

said latch including a handle movable between an open position corresponding to an unlatched door condition and a closed position corresponding to a latched door condition;

a switch mounted on said door;

said switch including a housing and a pushbutton slidably mounted in said housing and projecting therefrom for actuating said switch;

a deformable switch-actuating leaf attached at one end of said housing and having a free end extending over said pushbutton for engagement therewith;

said leaf including at its free end a reconfigurable coil;

said handle being disposed so as to engage said coil in moving from said open to said closed position for urging said leaf against said pushbutton to actuate said switch;

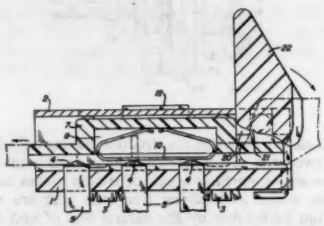
said handle engaging said coil during its initial movement from said open to said closed position to cause said coil to partially unroll, said coil re-rolling to an open coil position displaced a short distance from the closed position of said handle and disengaging from said handle as said handle returns to said open position, said coil being thereby disposed for subsequent engagement by said handle only when said handle closely approaches said closed position.

4,186,288

SLIDE SWITCH

Arthur W. Overton, Raleigh, and Allan J. Sykora, Cary, both of N.C., assignors to Stackpole Components Company, Raleigh, N.C.

Filed Sep. 1, 1978, Ser. No. 938,934
Int. Cl.[2] H01H *3/04, 15/10*
U.S. Cl. 200—164 R **4 Claims**



1. A slide switch comprising an elongated base, a metal housing covering the base and having a top wall spaced therefrom, a plurality of fixed contacts inside the housing spaced longitudinally of the base and mounted thereon, a slider inside the housing movable lengthwise of the base, a bridging contact carried by the slider for engaging said fixed contacts, the top wall of the housing being provided with a slot extending inwardly from one end of the housing, the top wall of the housing at opposite sides of the slot being bent downwardly to form side walls of the slot, each side wall being provided with an upwardly extending notch, and a lever disposed in said slot and normally extending above the housing, the lower end of the lever having integral laterally projecting trunnions extending through said notches and beneath said top wall, and the lower end of the lever outwardly beyond said trunnions extending downwardly into engagement with the end of said slider for pushing the slider toward the opposite end of the base when the upper end of the lever is swung manually outwardly away from said housing, including a spring for returning the slider toward said one end of the housing when said lever is released, and in which the slider holds said trunnions up in said notches when the slider is at said one end of the housing.

4,186,289

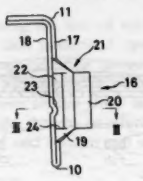
CONTACT CLIP FOR SWITCH

Katsuo Ito, and Yukio Kudoh, both of Kanazawa, Japan, assignors to Murata Manufacturing Co., Ltd., Kyota, Japan

Filed May 11, 1978, Ser. No. 904,809
Int. Cl.[2] H01H *1/00*
U.S. Cl. 200—284 **3 Claims**

1. A contact clip for a switch for dip soldered connection with an electrical conductor and for connecting the conductor with a switch contact, comprising: a resilient body having a fold portion at one end and a pair of facially superimposed layers extending from said fold portion and defining a terminal portion adjacent said fold portion and a mounting portion extending transversally outwardly from said terminal portion and terminating at the end opposite to said terminal portion in cooperating resilient jaws, one defined by each of said layers for connecting the clip to a said switch contact, said terminal portion having a pair of wings extending from one layer opposite to said mounting portion at said terminal portion, said wings extending one from each of the opposite edges of said terminal portion in the same general direction, two cuts being

formed spaced apart from each other, each said cut extending from a midway position of one wing through said one layer to a midway position of the other wing, with a portion from said midway position to the side edge of each wing being left uncut, an area of said one layer and said wings defined by said two



cuts being bent along the lines between said midway positions at each wing away from the other layer to define an elongated socket for receiving an electrical conductor between said area and said other layer, whereby an aperture is formed at each wing defined by said lines and said other layer, which facilitates said dip soldered connection.

4,186,290

PUSH BUTTON SWITCH

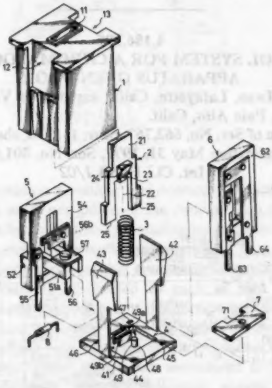
Katsuyuki Matsuo, Iwaki, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Dec. 26, 1978, Ser. No. 973,442

Claims priority, application Japan, Dec. 30, 1977, 52/178315; Feb. 10, 1978, 53/15745

Int. Cl.[2] H01H *13/14, 13/38*

U.S. Cl. 200—159 A **11 Claims**



1. A push button switch comprising:

a frame;

a switch lever;

a switch block accomodated by said frame and including,

(a) a carrier plate,

(b) an inversion leaf spring member made of an electrically conductive material and attached to said carrier plate so as to extend in parallel with the direction of the movement of said switch lever,

(c) a first and a second terminals fixed to said carrier plate and electrically connected to each other through said inversion leaf spring, and

(d) an actuator lever pivotally supported by said carrier plate and adapted to press said inversion leaf spring in response to the movement of said switch lever; and a coiled spring disposed between said switch lever and said actuator lever.

4,186,291

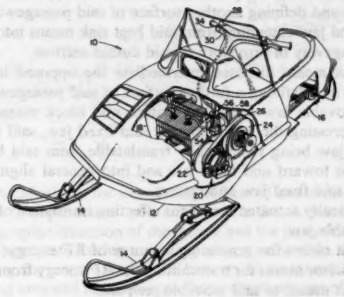
SWITCH AND THROTTLE LEVER COMBINATION FOR USE IN CONJUNCTION WITH SNOWMOBILE ENGINE SPEED LIMITING SYSTEM

Larry D. Swanson, Horicon, Wis., assignor to Deere & Company, Moline, Ill.

Filed Feb. 16, 1978, Ser. No. 878,547

Int. Cl.[2] H01H *9/06*

U.S. Cl. 200—61.86 **1 Claim**



1. An operator-presence sensing switch and throttle control, comprising: a support member provided with a transverse opening; a bore located in the support member in crosswise, intersecting relationship to the transverse opening; a switch located in the bore and having a pair of spaced contacts projecting into the opening; a throttle control lever having a pin fixed thereto and received in said opening; said opening being larger in cross-section than the pin in a direction aligned with said bore; a coil compression spring having an end received in the bore and being compressed between the switch and the pin to thereby simultaneously bias the pin away from the contacts and bias the switch into the bore; a throttle valve control means including a cable attached to the lever at a location spaced from the pin; and biasing means exerting a force on the cable which is greater than the force exerted by the spring on the pin.

4,186,292

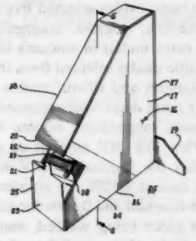
DESK MOUNTED TUBE SEALER

Loren C. Acker, Tucson, Ariz., assignor to Engineering & Research Associates, Inc., Tucson, Ariz.

Filed Oct. 11, 1977, Ser. No. 840,655

Int. Cl.[2] H05B *9/04;* B32B *19/02*

U.S. Cl. 219—10.81 **11 Claims**



1. A desk mounted sealer for sealing heat weldable tubing, said sealer comprising in combination:

a. a housing having top, bottom, front and rear sides of substantially less width than the length and breadth of opposed lateral sides;
b. a stand extending laterally from the opposed lateral sides of said housing for supporting said housing in combination with either of two sides of said housing;
c. a passageway extending through said housing from one side of said housing to another side of said housing, two opposed surfaces of said passageway being defined by the opposed lateral sides of said housing;
d. a cutout section disposed within the opposed lateral sides in proximity to the upper end of said passageway;
e. heat sink means disposed intermediate the opposed lateral sides and defining another surface of said passageway;
f. a fixed jaw extending from said heat sink means into said passageway in proximity to said cutout section;
g. block means disposed intermediate the opposed lateral sides and defining a further surface of said passageway;
h. a movable jaw journalled within said block means for compressing the tubing against said fixed jaw, said movable jaw being reciprocally translatable from said block means toward said fixed jaw and into general alignment with said fixed jaw and return;
i. electrically actuated means for effecting translation of said movable jaw;
j. circuit means for generating a source of RF energy;
k. conductor means for transmitting the RF energy from said circuit means to said movable jaw; and
l. switch means for energizing said electrically actuated means and said circuit means;

whereby, on placement of the tubing adjacent said fixed jaw and upon actuation of said switch means, the tubing is compressed intermediate said fixed jaw and said movable jaw and RF energy is transmitted from said movable jaw through the tubing to said fixed jaw to heat and seal the tubing with a weld.

4,186,293

CORED TYPE WELDING ELECTRODE

John Gonzalez; Ronald F. Young, both of Willoughby, and Mario A. Amata, Munson Township, Geauga County, all of Ohio, assignors to The Lincoln Electric Company, Cleveland, Ohio

Filed May 8, 1978, Ser. No. 903,852
Int. Cl.[2] B23K *35/30*
U.S. Cl. 219—146.24 **11 Claims**

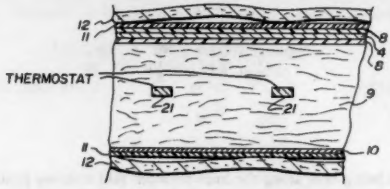
1. A cored type welding electrode comprised of a tube of mild steel having on the inside thereof a fill consisting of the following ingredients in weight percent of the total electrode weight: one or more basic oxides selected from the class consisting of lithium, barium, calcium, magnesium, strontium, cesium and the rare earth metals in amounts of from 3.6% to 10%; one or more acidic oxides selected from the class consisting of zirconium, titanium and silicon oxides in amounts of 0.0% to 5.0%; one or more deoxidizers selected from the class consisting of aluminum, magnesium, silicon, zirconium, and titanium, provided that the total amount of which selected deoxidizer is such that the residual thereof in the deposited weld metal will not exceed 1.10% for aluminum, 0.14% for zirconium, 0.14% for titanium and 0.40% for silicon, assuming no dilution from the piece being welded; and, one or more fluorides selected from the class consisting of the fluorides of calcium, barium, lithium, magnesium, potassium, sodium, strontium, cesium and the rare earth metals in amounts wherein the total combined fluorine does not exceed 0.5%.

4,186,294

RADIANT THERAPEUTIC HEATER

Joseph M. Bender, 244 McAdam Ave., Winnipeg, Manitoba, Canada (R2W 0A8)

Filed Apr. 5, 1978, Ser. No. 893,764
Claims priority, application Canada, Feb. 3, 1978, 296254
Int. Cl.[2] H05B *3/36*
U.S. Cl. 219—527 **12 Claims**



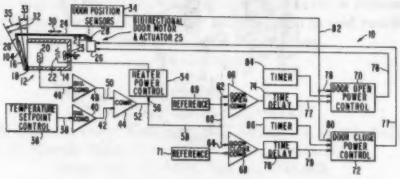
1. A radiant therapeutic heater comprising:
(a) a flexible black body radiant heat generating layer having a plane surface comprising means for radiating energy from its surface at a wavelength which penetrates into a body,
(b) a pair of flexible electrically insulating and radiant energy permeable layers located adjacent and covering opposite sides of said layer,
(c) a thermal insulation layer disposed against and covering one of the electrically insulating layers,
(d) a layer adapted to reflect said energy disposed against and covering the outside surface of the thermal insulation layer, and
(e) a sealed radiant energy permeable envelope enclosing the entire heater.

4,186,295

CONTROL SYSTEM FOR A CHROMATOGRAPHY APPARATUS OVEN DOOR

Kumiry R. Iwao, Lafayette, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 662,767, Mar. 1, 1976, abandoned. This application May 31, 1977, Ser. No. 801,663
Int. Cl.[2] H05B *1/02*
U.S. Cl. 219—497 **5 Claims**



1. In a chromatography apparatus of the type including an oven for a chromatographic column and electric heater means for controllably heating said oven, an improved system for controllably opening and closing the door of said oven to enable stabilization of the temperature in said oven at a desired set point, said improved system comprising:
means for generating a signal indicative of the temperature in said oven with respect to said set point;
heater power control means for receiving said oven temperature indicative signal, said control means being enabled by a first condition of said oven to effect heating of said oven and being inactive in response to a second condition of said oven;
bi-directional motor and actuator means for opening and closing said door over a prescribed operating range;

means for enabling said motor and actuator means to operate for a predetermined period upon said oven temperature indicative signal when said oven is in either of said first and second conditions departing from preset threshold values for predetermined periods, whereby opening and closing of said door can be effected in incremental steps; and

means for reducing the size of said incremental steps in a sub-range of said prescribed operating range, said sub-range being adjacent the closed position of said door, whereby the incremental steps in said sub-range can be reduced relative to the steps in the remainder of said operating range, thereby to effect fine control of opening and closing of said door in said sub-range.

4,186,296

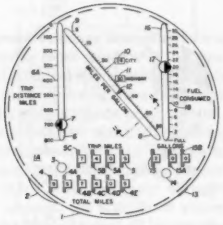
VEHICLE ENERGY CONSERVATION INDICATING DEVICE AND PROCESS FOR USE

John M. Crump, Jr., 1018 Parkridge Cir. West, Jacksonville, Fla. 32211

Filed Dec. 19, 1977, Ser. No. 861,965

Int. Cl.[2] G01M *15/00*; G06G *1/14*

U.S. Cl. 235—61 J **13 Claims**



1. In combination a vehicle fuel economy indicating device for indicating miles per gallon or the equivalent, a drive means operated by a fuel consumed measuring means, a connection to an odometer drive means, the improvement comprising two oppositely disposed cooperable measuring means, an alignment member operatively connected to each of said cooperable measuring means, said operative connection providing pivotal mounting means between said cooperable measuring means and said alignment member, said operative connection providing independent linear translation movement to each of the oppositely disposed pivotal mounting means, calibrated graphic display scales embodied on the face surface of said device, said face surface juxtapositioned above and parallel to said cooperable measuring means, a first and second scale oppositely disposed and functionally located with respect to each said measuring means, said first scale calibrated for distance traveled and said second scale calibrated for fuel consumed, a third scale diagonally disposed between said first and second scales and calibrated to read average miles per gallon or the equivalent, observation means provided on said face surface adjacent to said scales thereby allowing simultaneous viewing of the registrations with said scales, the consequential operation of said oppositely disposed cooperable measuring means together with said alignment member all relative to said calibrated scales according to a mathematical relationship for vehicle fuel economy thereby indicating the miles per gallon at any related trip distance and fuel consumed setting.

4,186,297

SUNLIGHT CALCULATOR

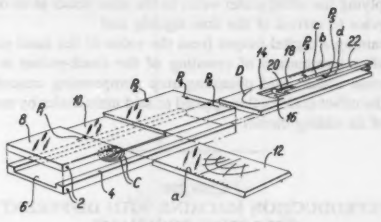
Paul Owner-Petersen, Gentofte, Denmark, and Kjeld B. Lund-Hansen, Krajbjergvej 3, Sködstrup, Denmark, assignors to Kjeld Balslev Lund-Hansen, Denmark

Filed Mar. 21, 1978, Ser. No. 888,650

Claims priority, application United Kingdom, Mar. 22, 1977, 12104/77

Int. Cl.[2] G06C *3/00*

U.S. Cl. 235—89 R **19 Claims**



1. A calculator for calculating effects of sun radiation on a facade in dependence upon an hour of a day, a date of a year, a geographic direction of the facade and the latitude, comprising a base plate having a reading area, a cross slide, means for holding the cross slide at the base so as to extend over said reading area and for enabling a linear displacement of the cross slide relative to the base plate, a first scale arranged on one of the base plate and cross slide, said first scale being divided into equidistant increments representing the geographic direction of the facade, said cross slide having a specific latitude range indicated thereon and a predetermined curve system of mutually intersecting curves which, in a coordinate system, respectively represent various hours of the day and various seasons or dates of the year, the curve system being arranged on the cross slide in such a manner that the location of points of intersection of the intersecting curves in an ordinate direction of said coordinate system indicating an azimuth angle of the sun on the first scale, with the points of intersection in an abscissa direction of the coordinate system indicating a function of the sun altitude, and wherein further indicia are provided in the reading area of the base plate for enabling a reading of relevant effects of the sun radiation as defined by a position of any of the intersection points of the intersecting curves in any characteristic position of said cross slide relative to the base plate.

4,186,298

METHOD FOR CONVERTING INPUT ANALOG SIGNALS TO TIME SIGNALS AND THE TIME SIGNALS TO DIGITAL VALUES

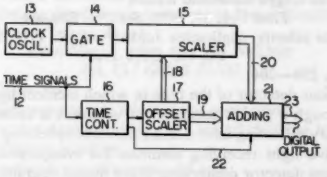
Setsuro Kinbara, Mito, Japan, assignor to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed May 19, 1977, Ser. No. 798,570

Claims priority, application Japan, Jun. 11, 1976, 51/68416; Jun. 11, 1976, 51/68417

Int. Cl.[2] G04F *11/06*; H03K *13/02*

U.S. Cl. 235—92 T **5 Claims**



1. An analog-to-digital converting method comprising:

generating time signals proportionately based on analog

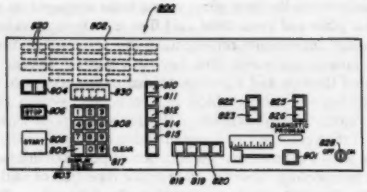
input signals by means of an analog-to-time converting circuit;
gating clock-pulses coming from a clock oscillator during the interval of each of said time signals;
counting a train of the clock-pulses gated during each time signal by means of a main scaler;
generating at random an offset scaler value for each train of said clock pulses, said offset scaler value randomly varied within a predetermined range at each conversion cycle corresponding to each time signal;
applying the offset scaler value to the main scaler as an offset prior to arrival of the time signals; and
obtaining a digital output from the value of the main scaler after termination of counting of the clock-pulses in the main scaler, said obtaining step compressing cancelling the offset scaler value applied to said main scaler by means of an adding circuit.

4,186,299

REPRODUCTION MACHINE WITH DIFFERENT OPERATING PROGRAMS

Phillip J. Batchelor, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 30, 1977, Ser. No. 829,025
Int. Cl.[2] G06F *11/04*
U.S. Cl. 235—304.1 **2 Claims**



1. A method of operating a reproduction machine under the control of a programmable digital computer for actuating reproduction machine components to produce copies from original documents, the method comprising storing at least one diagnostic program in the computer memory;
activating a diagnostic button on the console;
setting a service flag indicating a request to activate the diagnostic program;
displaying an indicator in the console display;
entering an access code in response to the indicator on the display console;
determining the validity of the access code and operating the reproduction machine to diagnose machine operation as identified by the access code.

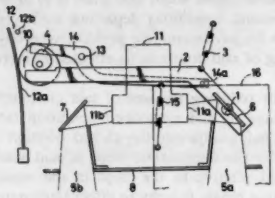
4,186,300

FOCUS DETECTOR

Masahiro Kozakai, Shimosuwa, Japan, assignor to Sankyo Kogaku Kogyo Kabushiki Kaisha

Filed Feb. 23, 1978, Ser. No. 880,463
Claims priority, application Japan, Nov. 30, 1977, 52-161088
Int. Cl.[2] G01J *1/20*
U.S. Cl. 250—204 **4 Claims**

1. Focus detector of the type in which incident light admitted through a pair of independent windows is reflected by a stationary reflecting mirror and a movable reflecting mirror to respective light receiving elements for comparison thereof, said focus detector comprising drive means operable to drive said movable reflecting mirror at a first speed of movement in a forward direction and at a second speed of movement in the reverse direction, said second speed being different from said first speed; and means operable to compare the light incident on said stationary mirror and that incident on said movable



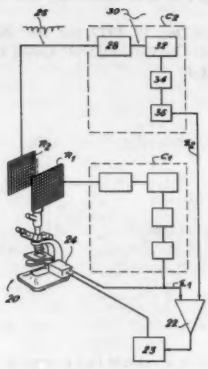
mirror only during the time said movable mirror moves at the lower of said first and second speeds.

4,186,301

AUTOMATIC FOCUS CONTROL FOR A MICROSCOPE

Alain Basire, Versailles; Pierre Roche, Maisons Alfort, and Jean Thenard, Versailles, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 6, 1978, Ser. No. 894,003
Claims priority, application France, Apr. 5, 1977, 77 10277
Int. Cl.[2] G02B *21/00*; H04N *5/26, 7/18*
U.S. Cl. 250—204 **7 Claims**



1. A process for the automatic correction of the focusing of a microscope in an image plane wherein:
two images of the same object are formed through two microscope outputs, said two images being formed in two different planes surrounding the image plane;
the light intensity of the different points of the two images is detected by means of two photo-detector matrices;
on the basis of the signals contained in each of the photodetectors the contrast of the two images is measured;
the two measured contrasts are compared;
a correction signal is produced which is a function of the variation between the said two contrasts;
by means of the said signal the microscope focusing correction means are operated so as to eliminate the variation wherein for measuring the contrast of an image from signals contained in photodetectors:
the signals contained in each of the photodetectors are transferred in a time lag register to the same number of cells as there are photodetectors;
the contents of the register cells are read out;
an analogue envelope signal is formed from the read-back signals;
an analogue to digital conversion is performed of said envelope signal and a sequence of digital samples is obtained;
the absolute values of the increment between each sample and the next is calculated;

the absolute values of the increments are summated which gives a signal representing the contrast.

4,186,302

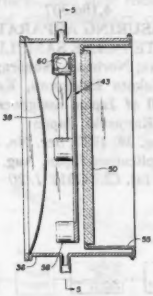
PANEL TYPE X-RAY IMAGE INTENSIFIER TUBE AND RADIOGRAPHIC CAMERA SYSTEM

Shih-Ping Wang, Los Altos, Calif., assignor to Diagnostic Information, Inc., Sunnyvale, Calif.

Division of Ser. No. 853,440, Nov. 21, 1977, Pat. No. 4,140,900, and a continuation-in-part of Ser. No. 741,430, Nov. 12, 1976, abandoned, and a continuation-in-part of Ser. No. 763,637, Jan. 28, 1977, abandoned. This application Jul. 12, 1978, Ser. No. 923,719

Int. Cl.[2] H01J *31/50*

U.S. Cl. 250—213 VT **9 Claims**



1. An x-ray sensitive image intensifier tube comprising a tube envelope, a metallic input window in the tube envelope, a flat, halide activated, alkaline halide scintillator screen adjacent the input window for converting the x-ray image into a light pattern image, a flat photocathode layer parallel and immediately adjacent to the scintillator screen for emitting photoelectrons in a pattern corresponding to the light pattern image, a flat, phosphor display screen parallel to and spaced apart from the photocathode layer with the space between them being an uninterrupted vacuum, the scintillator screen, the photocathode layer and the display screen all having diagonal dimensions at least equal to the actual size of the x-ray image to be intensified, and means for applying an electrostatic potential solely between the display screen and the photocathode layer to accelerate the pattern of photoelectrons toward the display screen along parallel, straight trajectories to impinge upon the output display screen.

4,186,303

EXCLUSION OF ALPHA PARTICLES FROM THORON IN URANIUM DETECTION

Richard C. Smith, O'Hara Township, Allegheny County, and Ira E. Kanter, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

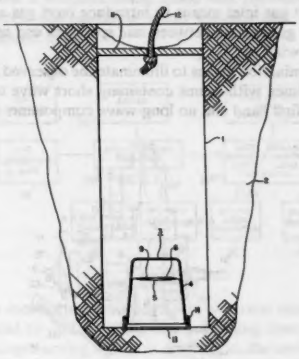
Filed Jan. 12, 1978, Ser. No. 868,779

Int. Cl.[2] G01V *5/00*; B01D *59/10*

U.S. Cl. 250—253 **20 Claims**

1. In a method of locating an underground deposit of uranium by detecting alpha particles from the uranium daughter product radon 222, which has emanated from beneath the ground, a method of avoiding the detection of alpha particles from the thorium daughter product radon 220 comprising:

(a) forming a completely enclosed volume V containing said detector into which radon can only enter via a fixed, water-insoluble, semipermeable membrane of silicone rubber about 0.05 to about 0.09 cm in thickness, said volume V enclosed by said membrane, excluding the volume of said detector, being between about 30 and about 2000 cm^3 and the (AP)/(VL) ratio being between 10^{-7} and 10^{-5}, where A is the radon-gas permeable area of said membrane, P is the permeability of said membrane, V is the volume enclosed by said membrane excluding the volume of said detector, and L is the thickness of said membrane; and



(b) positioning said detector within the volume V so that said detector is exposed to gas in contact with said membrane for a distance of at least 2 cm through a solid angle emanating from said detector of at least one steradian.

4,186,304

EXTENDER FOR DYE PENETRANT COMPOSITION

Orlando G. Molina, Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 17, 1978, Ser. No. 925,497

Int. Cl.[2] G01N *21/16*; C09K *11/06*

U.S. Cl. 250—302 **30 Claims**

1. A method for detecting cracks and other defects in the surface of an object which comprises applying to said surface a liquid dye penetrant composition comprising (1) a nonionic surfactant, (2) a small amount of a dye soluble in said surfactant and (3) as extender, a substantial portion of an isoparaffinic solvent consisting essentially entirely of a mixture of isoparaffins having carbon chains ranging from about 10 to about 17 carbon atoms and an average carbon chain ranging from about 12 to about 15 carbon atoms, said isoparaffinic solvent being present in an amount ranging from about 0.5 to 15 parts, to 1 part of the sum of said surfactant and said dye, by volume, removing excess dye penetrant composition from said cracks and defects in said surface, and viewing the surface of said object under lighting conditions to obtain colored traces from the dye in said cracks and other defects.

4,186,305

HIGH-TEMPERATURE MICROSCOPE

Tadami Taoka, Masashino; Fumio Nakajima; Hisashki Kawamura, both of Tokyo; Yutaka Hirano, Narashino; Kimio Maru, Chafu; Kazutoshi Arita, Itabashi, and Hidemasa Yoshida, Tokyo, all of Japan, assignors to Union Kogaku Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1978, Ser. No. 882,895

Int. Cl.[2] G01M *23/00*

U.S. Cl. 250—311 **9 Claims**

1. A high-temperature microscope comprising:

(a) a vacuum tank consisting of a sealed chamber having an observation window;

(b) an exhauster to evacuate said tank;

(c) an electron gun to emit electron beams to heat a specimen, said gun being located in said tank;

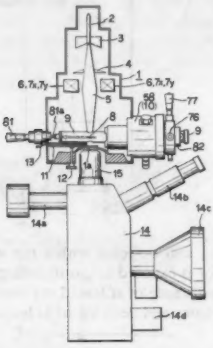
(d) electron beam control means for regulating the radiation

intensity and diameter of said electron beams emitted by said electron gun;

(e) specimen holder means for holding said specimen such that a first side of said specimen faces the beam radiation direction, while a second side of said specimen faces said observation window;

(f) inert gas inlet means to introduce inert gas and form an inert gas curtain between said specimen and said observation window;

(g) illumination means to illuminate the observed area of said specimen with beams containing short wave components of a first band and no long wave components of a second



band, said first band being located in the visible range in which heat radiation beams have low brightness, and said second band including heat radiation beams and being separate from said first band;

(h) an observation system and a photographic system including means for introducing therein only components of said first band in beams reflected from said observed area of said specimen; and

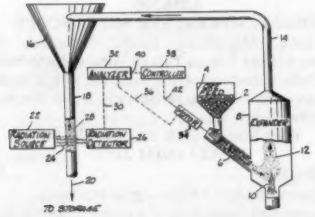
(i) a temperature-measuring system operatively connected to said electron beam control means and including means for introducing therein only components of said second band in beams radiated from said observed area of said specimen.

4,186,306

PERLITE EXPANSION DENSITY CONTROL SYSTEM

Carl G. Necker, Littleton, and Richard R. Colwell, Englewood, both of Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Filed Dec. 2, 1977, Ser. No. 856,821
Int. Cl.[2] G01M *23/00*
U.S. Cl. 250—360 **7 Claims**



1. In a perlite expansion process, an improved method for monitoring the density of the expanded perlite product, which method comprises:

(a) passing a non-homogeneous, granular expanded perlite product through a conduit section of predetermined volume;

(b) impinging penetrating radiation on one side of said conduit section while passing said expanded perlite product therethrough;

(c) detecting on the other side of said conduit section at least a portion of the unabsorbed fraction of said penetrating radiation which passes through said conduit section and said expanded perlite product; and

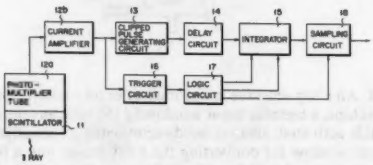
(d) obtaining a signal proportional to the density of said expanded perlite product by means of a predetermined correlation among mass flow rate of said expanded perlite product, conduit section volume, and detected amount of the unabsorbed fraction of the incident penetrating radiation.

4,186,307

RADIATION MEASURING APPARATUS EMPLOYING VARIABLE RATE PULSE SAMPLING CONTROL

Eiichi Tanaka, Mitaka; Norimasa Nohara; Takehiro Tomitani, both of Chiba; Makoto Kakegawa, Kawasaki, and Nobuo Kumano, Ebina, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Aug. 29, 1977, Ser. No. 828,811
Claims priority, application Japan, Aug. 31, 1976, 51-104025
Int. Cl.[2] G01T *1/20*
U.S. Cl. 250—363 S **14 Claims**



1. A scintillation type of radiation-measuring apparatus comprising:

means for producing radiation-induced scintillations;

means for detecting and converting said scintillations into electrical signals;

means for clipping said electrical signals during a clipping period t_c to produce pulses which are substantially representative of said scintillations;

means for delaying said pulses by a predetermined time period;

means for integrating the pulses produced at the output of said delaying means;

means for sampling the waveform produced by said integrating means; and

logic circuit means for generating instruction signals for controlling the operation of said integrating and sampling means according to the interval between adjacent ones of said electrical signals, thereby improving the radiation analyzing capacity of said radiation-measuring apparatus.

4,186,308

LARGE FORMAT PHOTOGRAPHIC FILM CASSETTE

Herman E. Erikson, Winchester, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 13, 1977, Ser. No. 841,889
Int. Cl.[2] G03B *17/26, 41/18*
U.S. Cl. 250—480 **8 Claims**

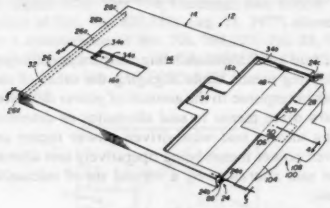
1. A substantially thin cassette for holding a photographic light sensitive film unit in a given film plane within the cassette, said cassette comprising:

spaced apart substantially parallel exterior surfaces defining its thinnest dimensions;

a film supporting surface within said cassette;

a substantially planar pressure member extending between and substantially parallel to said exterior surfaces; and

means for mounting said pressure member for displacement intermediate its said exterior surfaces between a first position wherein said pressure member is spaced apart from said film supporting surface, said spacing between said pressure member and said film supporting surface being sufficient to accomodate the ready insertion or withdrawal of a film unit from therebetween in a plane generally parallel to said exterior surfaces, and a second position wherein said pressure member engages one face of an inserted film unit so as to press the opposite face thereof against said film supporting surface to locate the film unit in the given film plane, said mounting means including two spaced apart slide rods supportively connecting respective edge portions of said pressure member and two spaced apart cam rods fixedly connected with respect to said exterior surfaces, said slide rods and said cam rods having respective complementary configured cam surfaces which cooperate to drive said pressure member into its said first position in response to movement of said slide rods from a first position to a second position, said mounting means also including a resilient biasing element for yieldably urging said pressure member into its said second position in response to the movement of said slide rods into their said first positions, said mounting means additionally including a slide cover disposed for selective actuable sliding movement between first and second positions in a plane between and substantially parallel to one of said exterior surfaces and said pressure member wherein said pressure plate includes at least one cam surface in fixed connection therewith between said slide rods and said slide cover includes at least one cam surface in fixed connection therewith between said slide rods and in opposed complementary relation to said pressure plate cam surface such that selective actuation of said slide cover between its said first and second positions operates to provide a corresponding force urging said pressure plate toward its said second position.



4,186,309

WEB MONITORING AND CONTROL APPARATUS FOR WEB HANDLING MACHINERY

Herman C. Gnuechtel, Chicago, Ill., assignor to Web Printing Controls Co. Inc.,, Bensenville, Ill.

Filed Oct. 13, 1977, Ser. No. 841,901
Int. Cl.[2] G01N *21/30*
U.S. Cl. 250—561 **12 Claims**

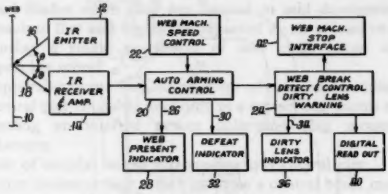
1. Apparatus for monitoring a web of material being moved by web handling machinery having operating control means, said apparatus having at least one web monitoring station for monitoring the web adjacent thereto, each web monitoring station comprising:

means for intermittently emitting infrared energy toward the web at a predetermined frequency and angle relative to a line generally perpendicular to the plane of the web;

means for detecting infrared energy reflected from the web, and for generating electrical signals that selectively indicate the presence and absence of reflected infrared energy;

means responsive to said electrical signals indicating the absence of said energy for interacting with the operating control means of the machinery to stop the web handling machinery;

means for automatically disabling said detecting and generating means when said web handling machinery is operating below a predetermined speed and for enabling the same when the operating speed exceeds said predetermined speed; and,



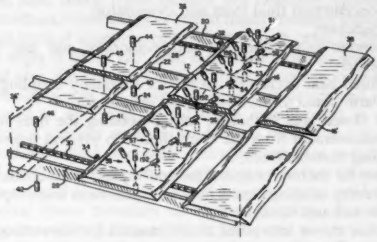
means for monitoring the level of said electrical signals being generated by said detecting and generating means and for producing warning signals in response to the energy being detected being less than a desired value when reflected energy is being detected, thereby providing a warning that said detection means may be becoming dirty.

4,186,310

AUTOMATIC WANE DETECTOR

Carl W. Maxey, P.O. Box 65, Corvallis, Oreg. 97330

Filed Jun. 19, 1978, Ser. No. 916,596
Int. Cl.[2] G01N *21/30*
U.S. Cl. 250—561 **32 Claims**



1. A scanner for detecting the position and lateral extent of the acceptable wood surface of a cant as distinguished from the wane at the edge of said cant, comprising:

a first source of electromagnetic radiation for positioning on a first side of said cant adjacent the wane thereof,

a detector of electromagnetic radiation aligned with said source and positioned on the opposite side of said cant from said source,

means for producing relative movement between said cant and the combination of said first source and said detector such that said cant essentially moves between said first source and said detector for interrupting the radiation received from said first source by said detector as the edge of said cant passes therebetween,

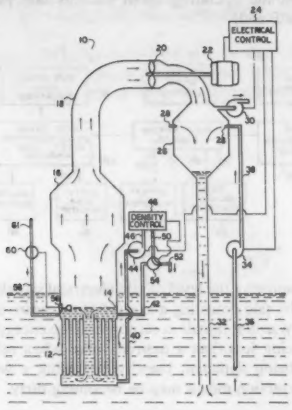
and at least one second source of electromagnetic radiation positioned on the same side of said cant as said detector and the wane of said cant for directing radiation toward the acceptable wood surface of said cant at an angle relative to said surface and intersecting said surface for producing detection of radiation from said second source by said detector only when said surface has the correct level.

4,186,311

HEAT PUMP METHOD OF CONCENTRATING FLUIDS

Gerald F. Humiston, E 26, 1335 U.S. Highway 19 South, Clearwater, Fla. 33516

Filed Jun. 17, 1977, Ser. No. 807,354
Int. Cl.[2] H02P *9/04*
U.S. Cl. 290—1 R **10 Claims**



1. An apparatus for concentrating a fluid through the use of a warm liquid and a cool liquid and for providing electrical power, comprising in combination;

an evaporator;

input means connected to said evaporator for introducing a fluid into said evaporator;

said evaporator producing a concentrated fluid and a vapor;

output means connected to said evaporator for removing the concentrated fluid from said evaporator;

a condenser;

a conduit interconnecting said evaporator and said condenser;

a closed heat exchanger means for thermally coupling the warm liquid to the fluid in said evaporator;

said closed heat exchanger means isolating the fluid to be concentrated from the warm liquid to prevent intermingling therebetWeen;

means for thermal coupling the cool liquid to said condenser thereby creating a mass flow of vapors from said evaporator and said condenser;

a prime mover interposed in said conduit for converting the mass flow of vapors into mechanical movement;

an electrical generator coupled to said prime mover for generating electrical energy; and

electrical control means connected to said electrical generator for directing the output of said electrical generator for operating the apparatus and for directing excess electrical energy produced by said electrical generator for external use.

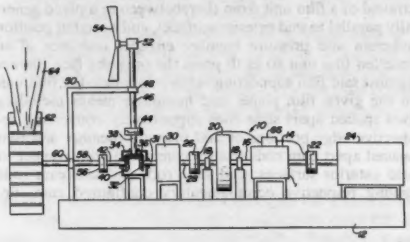
4,186,312

AC ELECTRICAL POWER SYSTEMS WITH ALTERNATE SOURCES OF POWER

Sidney T. Dvorak, 9425 Stenton Ave., Philadelphia, Pa. 19118

Filed Feb. 23, 1978, Ser. No. 880,466
Int. Cl.[2] F01D *15/10*
U.S. Cl. 290—4 R **7 Claims**

1. An electrical power system comprising an alternator for generating AC current, primary drive means and emergency drive means for said alternator, said primary drive means comprising alternatively engaged wind-driven power means and water-driven power means, and said emergency drive means comprising a fuel-driven engine, said primary and emergency drive means being operatively and alternatively coupled to said alternator by corresponding releasable coupling means, switch means operatively connected to each of said coupling means, and a sensing means operatively connected to said alternator and to said switch means, said sensing means being adapted to sense the power delivered to the alternator and to actuate and deactuate said switch means in accordance with whether a predetermined power is being delivered to said



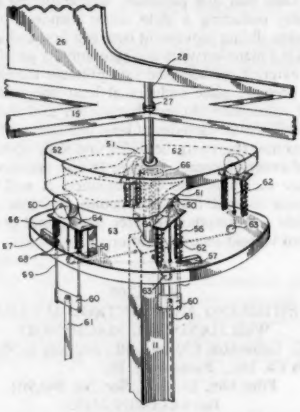
alternator, said switch means being adapted to disengage one of said coupling means while engaging the other of said coupling means in response to the amount of power delivered from said primary drive means to said alternator as determined by said sensing means, said wind-driven power means and said water-driven power means being operatively and alternatively coupled to said alternator by a second set of releasable coupling means.

4,186,313

WIND GENERATOR

Frank R. Wurtz, 4570 Apricot Rd., Simi Valley, Calif. 93063

Filed Mar. 1, 1978, Ser. No. 882,377
Int. Cl.[2] H02P *9/04*; F03D *9/00*
U.S. Cl. 290—44 **10 Claims**



1. Windmill generator apparatus for converting natural wind forces into useful energy comprising the combination of:

a stationary frame

a shaft having a vertical longitudinal axis rotatably carried on said stationary frame;

at least four sets of blades outwardly extending from said rotatable shaft at approximately 90 degree angles with respect to each other;

each of the sets of blades having a plurality of blades pivotally mounted on said shaft so as to rotate therwith and pivot between an open position defining a multiplicity of

air passageways therebetween and a closed position occupying said air passageways;

wind direction sensing means movably carried on said stationary frame and operably connected to said blades of said blade sets for actuating said blades between their open and closed positions responsive to changes of oncoming wind direction;

means for causing one set of blades while closing to assist the opposite set of blades to open;

means for disabling the wind generator;

mechanical means connecting wind direction sensing means with said blades which includes;

a squash plate solidly connected to said wind direction sensing means which by means of wheels abutting against said squash plate through the action of springs control the opening and closing of said blades automatically.

4,186,314

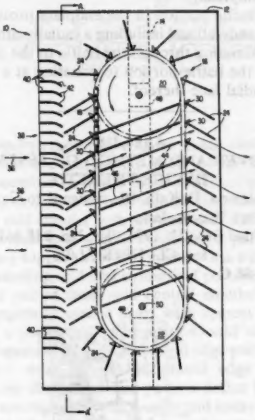
HIGH EFFICIENCY WIND POWER MACHINE

Richard E. Diggs, P.O. Box 776, Carthage, Mo. 64836

Continuation of Ser. No. 823,739, Aug. 11, 1977, abandoned, which is a continuation of Ser. No. 708,227, Jul. 23, 1976, abandoned. This application Jul. 13, 1978, Ser. No. 924,353

Int. Cl.[2] F03D *5/02*

U.S. Cl. 290—55 **5 Claims**



1. A wind power conversion structure comprising:

a plurality of modules, each module including:

a supporting structure mounted so that wind moves from an upstream side of said supporting structure to a downstream side thereof;

a sprocket wheel rotatably mounted on said supporting structure;

a power generating means mounted on said supporting structure and connected to said sprocket wheel to be operated by rotation of said sprocket wheel;

an endless chain trained around said sprocket wheel to define an elongate loop having a longitudinal axis which is oriented to be essentially vertical so that said chain has an upstream reach located adjacent said supporting structure upstream side and a downstream reach located adjcent said supporting structure downstream side;

a multiplicity of planar guide vanes mounted on said supporting structure to extend transversely across said supporting structure from a point immediately adjacent said upstream reach to a point immediately adjacent said downstream reach to define a multiplicity of linear raceways through which air flowing through said supporting structure is conducted in a multiplicity of separate rectilinear paths through said structure from said upstream reach of said chain to said downstream rech thereof so that a substantial portion of the area within said chain loop is subdivided into a multiplicity of separate rectilinear paths by said guide vanes; and

a plurality of planar blades pivotally connected to said chain to extend outwardly of said chain loop in both of said reaches and to tilt downwardly in said chain reaches so that air located on said upstream side of said structure contacts said blades when they are located in said upstream reach and air exiting from said raceways contacts said blades when they are located in said downstream reach so that said blades are impacted by air at least twice during a single revolution of said chain about said sprocket wheel

a supporting frame for said plurality of modules including:

a central pier rotatably anchored in a supporting means and having an internal power collecting ring mounted thereon;

a pair of circular tracks surrounding said central pier;

a frame undercarriage which includes a central brace member connected at one end thereof to said central pier, said central brace member being constructed to serve as an airfoil fin to guide the power conversion structure into a wind facing orientation, a pair of lower lateral frame members each connected at one end thereof to said central pier to form an angle of about 120° with each other and being located on opposite sides of said central brace member, a main lateral frame member extending across essentially the entire width of the power conversion structure, a pair of rear lateral undercarriage braces coupled together and to another end of said central brace member to extend in an angular manner to the outer tips of said main lateral frame member and coupled thereto to define a triangular configuration, a plurality of wheels mounted on said frame undercarriage and riding in said circular tracks to guide the power conversion structure, a plurality of vertical support members fixed at lower ends thereof to said main lateral frame member and extending upwardly therefrom, a pair of upper lateral frame members joined to said vertical support members and to each other to define an angle of about 120° with each other adjacent said central pier, top and bottom main frame members extending laterally across the power conversion structure and connected to said main lateral frame member and to said vertical support members to define a rectangular framework extending essentially entirely around the periphery of the power conversion structure at a rear face thereof, a plurality of angle girders secured to said upper and lower lateral frame members forming a plurality of module accommodating compartments; and

a plurality of wind trap vanes mounted on said angle girders to define wind trapping compartments adjacent each module accommodating compartment for directing wind into power conversion modules accommodated in each compartment.

4,186,315

EXPANDED TIME CONSTANT CONDITION CONTROL SYSTEM USING A UNIDIRECTIONAL COUNTER WITH MULTIPLE CHANNELS

Ronald Benton, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

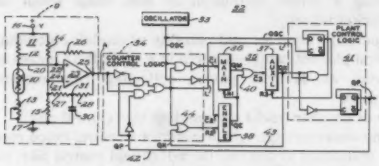
Filed Jul. 28, 1978, Ser. No. 928,667

Int. Cl.[2] G05D *23/24;* **H05B** *1/02;* **G05B** *11/16*

U.S. Cl. 307—117 **10 Claims**

1. An expanded time constant condition control system, including: condition responsive time proportional control means having switched output means; said switched output means providing repetitively switched output signals at a rate representative of a time constant of said time proportional control means when said condition responsive means senses a condition which is within a selected range; said switched output means providing constant output signals when said condi-

tion is outside of said selected range; counting means including a plurality of unidirectional counters with said counting means having input means responsive to said switched output signals; said counting means further including pulses generating means; said pulse generating means having output means connected to said counting means and providing signals thereto; said plurality of unidirectional counters including two counting channels; a first counting channel normally processing signals from said time proportional control means output means and said pulse generating means; a second counting channel being held in a



state of readiness when said first counting channel is normally processing signals from said output means; said second counting channel enabled to provide an override function for said counting means when said normal processing of signals has been disrupted for a preselected period of time; and said counting means combining said condition responsive repetitively switched output signals and said pulse generating output signals to expand said time constant of said condition responsive time proportional control means at an output means of said counting means.

4,186,316

SHAPED ROTOR TEETH FOR STEPPING MOTORS

Gurdial Singh, Avon, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Apr. 3, 1978, Ser. No. 892,638

Int. Cl.² H02K *37/00*

U.S. Cl. 310—49 R **2 Claims**

1. In a stepping motor having a stator and a rotor; said stator being formed with a plurality of elongate radially inwardly extending teeth and means for magnetizing the teeth; said rotor having an axis and being formed with a plurality of elongate inwardly extending teeth on a portion of its periphery; said rotor being positioned in said stator to have the teeth of each axially aligned with the rotor being caused to assume a plurality of static step positions in each revolution by the stator teeth magnetizing means; the improvement comprising the periphery of each of the rotor teeth opposite the stator teeth having a more acute diametrical cross-sectional peripheral shape than an arc subtended by a radius having the axis of the rotor as its center, in which each of said teeth has the same identical shape with the shape extending throughout the elongate extent of each tooth, in which the periphery of each tooth is symetrical about its midpoint, in which the midpoint of periphery of each tooth lies on the arc, in which the ends of the periphery of each tooth are nearer the rotor axis than the midpoint and in which the peripheral shape is an arc having a radius somewhat less than the radius of the arc that extends from the axis.

4,186,317

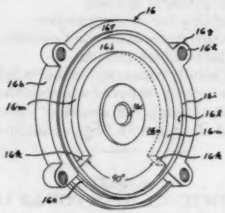
ENDPLATE WITH CAST-IN BAFFLE

Hollis D. Sisk, 329 Ridge Meadow, Chesterfield, Mo. 63017

Continuation of Ser. No. 730,369, Oct. 7, 1976, abandoned. This application Apr. 3, 1978, Ser. No. 893,057

Int. Cl.² H02K *9/00*

U.S. Cl. 310—60 R **2 Claims**



1. In an endplate for electric motors including an annular endwall portion in the endplate, and an annular side wall portion in the endplate protruding axially from the endwall and including a radially directed opening formed therein; the improvement comprising:

an annular baffle portion in the endplate protruding axially from the endwall and including a radially directed passage therein extending through the baffle to the opening in the sidewall, the baffle portion terminating at a less than 360 degree radial face thereof.

4,186,318

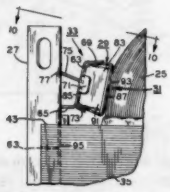
PRIME MOVER AND METHOD OF ASSEMBLING A DEVICE THERETO

Wesley K. Anderson, DeKalb, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Sep. 22, 1977, Ser. No. 835,661

Int. Cl.² H02K *11/00*

U.S. Cl. 310—68 C **24 Claims**



1. A prime mover comprising a stator having a pair of opposite end faces, a peripheral surface on said stator intersecting with said end faces, respectively, a plurality of windings adapted for energization disposed in said stator including a generally annular grouping of winding end turns extending from said stator adjacent one of said end faces and spaced generally radially inwardly of said peripheral surface of said stator, an opening in said stator at least adjacent said peripheral surface thereof and intersecting with at least said one end face, a structural member of the prime mover disposed in said opening and extending therefrom past said one end face in spaced relation with said winding end turn grouping, a space between confronting surfaces of said opening and said structural member disposed therein, means for sensing ambient temperature adjacent said winding end turn grouping and operable generally to effect deenergization of said windings in the event of the occurrence of a current overload condition, and means associated with said stator and said sensing means for positioning said sensing means in abutting engagement with a part of said winding end turn grouping including a body portion having a pair of generally opposite end portions, an intermediate portion

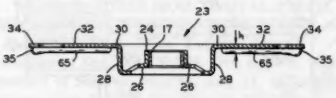
integrally interconnected between said opposite end portions so as to offset said opposite end portion generally in different planes from each other, one of said opposite end portions being inserted into said space so as to be disposed in displacement preventing engagement with at least said stator, means on said body portion disposed in abutting engagement with said one end face for positively limiting the insertion of said one opposite end portion into said space, the other of said end portions being disposed generally between said structural member and said part of said winding end turn grouping and in supporting engagement with said sensing means, and means on said other end portion extending therefrom into abutting engagement with said structural member for urging said other end portion in a direction generally toward said part of said winding end turn grouping so as to bias said sensing means into engagement therewith.

4,186,319

DYNAMOELECTRIC MACHINE END SHIELD

Richard W. Dochterman, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Apr. 26, 1977, Ser. No. 791,052
Int. Cl.[2] H02K 5/00
U.S. Cl. 310—89 **6 Claims**



1. In an electric motor having an outer shell and an end frame at at least one end of said shell; where said end frame comprises a member having a first cylindrical portion constituting a hub, said first cylindrical portion terminates in an annular web, said annular web terminates at a second cylindrical portion coaxial with said first cylindrical portion and comprises a bearing support hub, said member has a central annular portion surrounding said first cylindrical portion, a plurality of radial spokes extend from said central annular portion, said spokes are angularly spaced apart with respect to each other and lead to a peripheral edge portion; said central annular portion, said spokes and said peripheral edge portion are generally coplaner; wherein said peripheral edge portion, said spokes and said central annular portion define four depressed areas which are depressed rearwardly and interconnected with the peripheral edge portion, spokes, and central annular portion with axially extending ribs; and wherein said depressed areas are generally coplanar and lie in a plane generally parallel to and spaced axially from the plane of said central annular portion, spokes, and peripheral edge portion; the improvement wherein: said peripheral edge portion has areas of enlarged width between each adjacent pair of said spokes whereby clamp bolt mounting pads are defined; and wherein said axially extending ribs are positioned between said clamp bolt mounting pads and said central annular portion whereby isolation of said central annular portion from clamp bolt mounting pad distortion is provided.

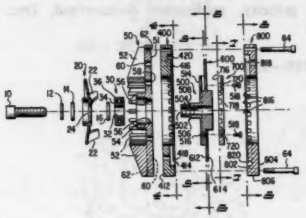
4,186,320

HYSTERESIS BRAKE ASSEMBLY

Darrel D. Hillman, Weatherford, Tex., assignor to Electromatic Drive Corporation, Fort Worth, Tex.

Filed Oct. 21, 1977, Ser. No. 844,311
Int. Cl.[2] H02K 49/00
U.S. Cl. 310—93 **21 Claims**

1. An electradynamic brake assembly comprising:
a fan;
first and second hub members; and
a flat disc shaped brake member located between said hub members and having a first and second side;
all of which rotate about a common axis;
said fan being provided with a plurality of blades which generate a flow of air which proceeds axially toward said first hub member;
said first hub member being provided with means to divide said flow of air into a first portion and a second portion;
said first portion being directed radially outward so as to flow over the first side of said brake member;
said second portion being directed axially toward said second hub member through a plurality of axially extending air flow holes provided in said brake member whereby air flows through the brake member from the first side of the brake member to the second side of the brake member at which point the air flow is redirected by means provided on said second hub member to flow in a radially outward direction so as to flow over said second side of said brake member;
whereby said brake member is equally and uniformly cooled on both its first and second sides by flowing air.

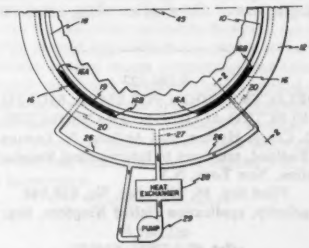


4,186,321

CURRENT COLLECTOR WITH COMPLIANT BRUSH CONTAINING LIQUID METAL RESERVOIR

Robert A. Marshall, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 17, 1978, Ser. No. 878,786
Int. Cl.[2] H02K 31/00
U.S. Cl. 310—178 **17 Claims**



1. An electrical current collector for an electrical machine comprising:
a rotor collector ring;
a stator collector ring encircling said rotor collector ring;
at least one U-shaped compliant brush attached to said stator collector ring, said brush being fabricated of electrically conductive, liquid metal-permeable material extending radially-inward to a location closely adjacent, but out of physical contact with, said rotor collector ring;
liquid metal filling the region enclosed between said stator collector ring and said brush, said liquid metal seeping outward from said region through interstices within the walls of said brush so as to establish electrical contact

between said rotor collector ring and said brush at the innermost periphery of said brush; and

pumping means coupled to the interior of said brush to replenish liquid metal lost from said interior of said brush by seepage outward through the walls of said brush.

4,186,322

ELECTRIC ROTARY STEPPING MOTOR

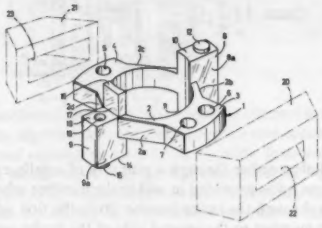
Francis Besson, Savagnier, Switzerland, assignor to Girard-Perregaux S.A., Neuenburg, Switzerland

Filed Dec. 12, 1977, Ser. No. 859,599

Claims priority, application Switzerland, Dec. 22, 1976, 16192/76

Int. Cl.² H02K *1/06*

U.S. Cl. 310—194 **8 Claims**



1. An electric rotor stepping motor for a watch movement comprising two frame elements, two coaxial bearings each borne by each of said frame elements, a rotor pivotally mounted between said bearings, a one-piece coil support of a non-magnetic material, surrounding said rotor, two compact coils having flat turns, borne by said coil support, and a field-closing yoke made of a low-remanence material, disposed coaxially with said coil support and provided with magnetic rotor blocking means, wherein said coil support comprises a ring-shaped portion, at least three axially projecting portions arranged in a same diametrical plane, and two diametrically opposed projecting arms perpendicular to said plane and having a cross-section decreasing away from said ring-shaped portion, said projecting portions engaging both said frame elements, thus holding said coil support between said frame elements, and said coils are self-supporting elements formed of turns which are joined to one another, each of said coil elements engaging one of said arms and being adhesively secured thereto.

4,186,323

PIEZOELECTRIC HIGH POLYMER, MULTILAYER ELECTRO-ACOUSTIC TRANSDUCERS

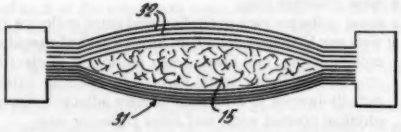
William D. Cragg, Harlow, and Anthony N. Lawson, London, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Sep. 16, 1977, Ser. No. 833,849

Claims priority, application United Kingdom, Sep. 21, 1976, 39063/76

Int. Cl.² H01L *41/10*

U.S. Cl. 310—324 **6 Claims**



1. An electro-acoustic transducer comprising:

a pair of piezo-electric plastic foil diaphragms having lenticular portions, each of said diaphragms including a plurality of spaced layers of said plastic foil; and

a separate surface electrode disposed on each surface of each of said plurality of layers, each of said plurality of layers being electrically polarized such that the movement of said pair of diaphragms generates a potential difference between said surface electrodes of each of said plurality of layers and the application of an alternating voltage to said surface electrodes causes said pair of diaphragms to vibrate; and

said surface electrodes are interconnected such that said pair of diaphragms operate in a push-pull manner.

4,186,324

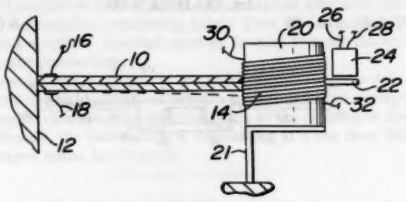
LINEAR ACCELEROMETER WITH PIEZOELECTRIC SUSPENSION

Robert E. Hartzell, Jr., Voorhees, N.J., assignor to Schaevitz Engineering, Pennsauken, N.J.

Filed May 11, 1978, Ser. No. 905,010

Int. Cl.² H01L *41/10*

U.S. Cl. 310—329 **7 Claims**



1. Means for generating output signals representing acceleration forces comprising:

a. a torque coil;

b. means for producing a magnetic field;

c. base means;

d. a piezoelectric flexure member connected to said base means and supporting said torque coil in said magnetic field;

e. said piezoelectric flexure member permitting said torque coil to be moved in said magnetic field to produce voltage signals across said piezoelectric member in accordance with the movement of said torque coil; and

f. utilization means for receiving the voltage signals produced by said piezoelectric member.

4,186,325

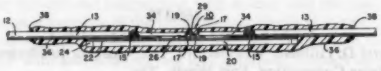
CABLE SUPPORTED PIEZOELECTRIC BENDER INTRUSION DETECTOR ARRAY

Martin G. Gudzin, Dallas, Tex., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Aug. 18, 1978, Ser. No. 935,043

Int. Cl.² H01L *41/10*

U.S. Cl. 310—331 **8 Claims**



1. A combined detector unit and connecting cable for use in an array of multiple interconnected units to be buried below the surface of the earth and coupled to circuitry to detect intrusions which apply pressures to said surface above the array, comprising:

a cable having an insulating jacket of predetermined outer diameter and having plural conductors within said jacket;

at least one detector unit comprising a flexible board having a conductive surface, the board having a length which is much greater than its transverse width, a piezoceramic transducer wafer having one side conductively bonded to the conductive surface of the board and spaced from the longitudinal ends of the board and the wafer having a metal electrode conductively bonded to its other side;

the cable being disposed longitudinally across the board and extending beyond the board both ways from its transverse ends and having its jacket cut away in the vicinity of the transducer wafer and having one of its conductors connected to said conductive surface and having another conductor connected to said electrode; and

heat shrinkable insulating tubing surrounding the board and the portions of the cable immediately adjacent to the board, the tubing being heat shrunk to conform tightly to the board and said cable portions to structurally unify the board and cable portions and provide them with stiffness against flexing at least as great as the stiffness of the cable beyond said adjacent cable portions, and the tubing being sealed to the cable portions to exclude the entry of moisture.

4,186,326

SHADOW MASK HAVING VERTICAL PITCH ABOUT 8/(2N−1) TIMES HORIZONTAL PITCH

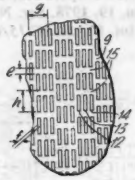
Kakuichiro Hosokoshi, Neyagawa, Japan, assignor to Matsushita Electronics Corporation, Kadoma, Japan

Continuation of Ser. No. 730,069, Oct. 6, 1976, which is a continuation of Ser. No. 603,511, Aug. 11, 1975, which is a continuation of Ser. No. 475,271, May 31, 1974, abandoned. This application Oct. 19, 1978, Ser. No. 952,648

Claims priority, application Japan, Jun. 18, 1973, 48-69545

Int. Cl.[2] H01J *29/06, 29/32*

U.S. Cl. 313—408 **1 Claim**



1. In a color picture tube, wherein a set of three electron beams emitted from respective three electron-emitting members of an electron gun, or from respective three electron guns, is projected through rectangular slots of a shadow mask onto a screen, and sets of three luminous strips of differently colored phosphors located on the screen are selectively energized by the beams to emit luminous color lights, the improvement comprising the arrangement wherein the numerical ratios between the number of said luminous strips and said slots of the shadow mask, respectively, are about 1:1 vertically and about 3:1 horizontally, and every strip is completely insulated from adjacent strips of its set and those of the remaining sets by a light absorbent film filling all the gaps in between, each luminous strip being of a vertically oblong shape similar to that of each slot and being arranged in vertical alignment with strips of the same color phosphor, the vertical pitch of the luminous strips and of the slots being set to be about 8/(2n−1) times the scanning line pitch, wherein n is an integer, the vertical lengths of the luminous strips being selected between the value when the vertical gaps (e) between aligned luminous strips are equal to the vertical gaps (k) between successive horizontal scans of the electron beams on the screen, and a value roughly equal to the vertical lengths of the slots of the shadow mask, and the widths of the luminous strips (w) are less than the widths of sections of the electron beams on the screen.

4,186,327

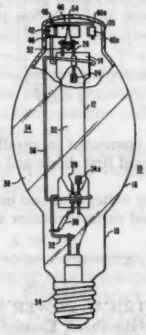
SAFETY SWITCH WHICH RENDERS HIGH INTENSITY DISCHARGE LAMP INOPERATIVE ON ACCIDENTAL BREAKAGE OF OUTER ENVELOPE

John Petro, Belleville, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 15, 1977, Ser. No. 777,864

Int. Cl.[2] H01J *7/44, 17/34, 23/16;* **H01K** *1/62*

U.S. Cl. 315—73 **10 Claims**



1. In combination with a high-intensity discharge lamp comprising an elongated radiation-transmitting arc tube which is enclosed by and supported within a light-transmitting protective envelope which is opaque to short-wavelength ultraviolet radiations, said arc tube enclosing a discharge-sustaining filling and having electrodes operatively positioned therein proximate the ends thereof, electrical lead-in members sealed through said arc tube and connected to said electrodes, electrical adaptor means affixed to the outer surface of said protective envelope to facilitate electrical connection of said lamp to a source of electrical power, and electrical conductor means electrically connecting said electrical adaptor means to said electrical lead-in members, the improvement which comprises:

(a) a thin strip-like conductor member affixed to and carried on a portion of the inner surface of said protective envelope which will normally fracture upon any breakage of said protective envelope, said thin strip-like conductor member being sufficiently fragile that it will break and interrupt the electrical continuity thereof if the protective envelope portion upon which it is carried is fractured, and

(b) electrical contact means connecting said thin strip-like conductor member in series with said electrical conductor means, whereby breakage of said protective envelope will fracture said thin strip-like conductor member and interrupt the electrical path between said electrical adaptor means and said electrical lead-in members to render said lamp inoperative.

4,186,328

ELECTRONIC FLASH

Yuji Maruyama, Suita, Japan, assignor to West Electric Company, Ltd., Osaka, Japan

Filed Apr. 26, 1978, Ser. No. 900,299

Claims priority, application Japan, Apr. 30, 1977, 52/50215

Int. Cl.[2] H05B *41/32;* **H04B** *41/36*

U.S. Cl. 315—151 **4 Claims**

1. In an electronic flash of the type incorporating a variable guide number device comprising a signal generating circuit comprising

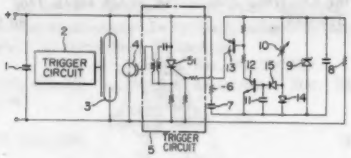
an integrating circuit for integrating a voltage across a constant voltage element which is actuable in response to turning on of a flash lamp, and a switching circuit actuable in response to the output from said integrating circuit; and

a flash control circuit for controlling the quantity of a flash

of light emitted from said flash lamp in response to the output from said signal generating circuit;

the improvement wherein said integrating circuit comprises

a series circuit consisting of a variable resistor, a first diode and an integrating capacitor connected in series in the order named; and



a second diode connected in parallel with a series circuit consisting of said first diode and said integrating capacitor,

whereby a charging voltage for said integrating capacitor may be controlled by said variable resistor and said first and second diodes.

4,186,329

ELECTRICAL POWER SUPPLIES

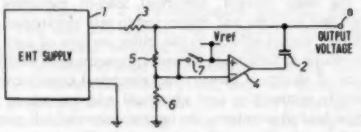
Ian A. Fairbairn, Maidenhead, England, assignor to EMI Limited, Hayes, England

Filed Apr. 27, 1978, Ser. No. 900,597

Claims priority, application United Kingdom, Apr. 29, 1977, 17977/77

Int. Cl.² G05F *1/62*

U.S. Cl. 315—241 R **5 Claims**



1. An electrical power supply including: a source for supplying electrical energy at a constant current and at a desired potential; capacitor means, connected to the source to be changed thereform, for supplying a pulse, having a predetermined duration, of electrical energy at a rate in excess of the rate of supply by the source; an output terminal, connected to one side of the capacitor means, to which the pulse is supplied; and compensating means connected to the side of the capacitor means remote from the output terminal and responsive during the supply of the pulse to a drop in the voltage at the output terminal below a reference level to apply to the said side of the capacitor means remote from the output terminal a compensating voltage which varies oppositely to the variation in voltage across the capacitor means, to maintain the voltage at the output terminal substantially constant during the supply of the pulse.

4,186,330

VOLTAGE REGULATOR FOR A TELEVISION DEFLECTION CIRCUIT

Walter Böhringer, Schlieren, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Nov. 7, 1977, Ser. No. 849,462

Claims priority, application United Kingdom, Nov. 23, 1976, 48822/76

Int. Cl.² H01J *29/70*

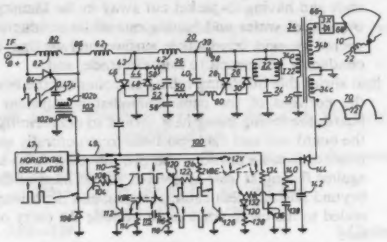
U.S. Cl. 315—411 **17 Claims**

17. A horizontal deflection circuit for a television receiver having a horizontal first stage including means for controlling line sweep and commutation, the energy required by each horizontal first stage being provided by a controllable supply circuit comprising:

a source of DC energy;

a storage inductance;

a second inductance connected in series with said storage inductance, said series connection being disposed between said source of DC energy and said horizontal final stage; and



a thyristor connected in parallel with said second inductance and controlled to allow current from said source of DC energy to bypass said second inductance and flow directly to said storage inductance, whereby current returning to said DC source from said storage inductance must flow through said second inductance.

4,186,331

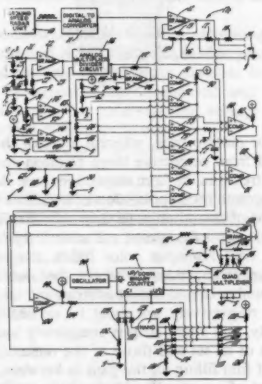
ROTATING ELEMENT ROTATIONAL SPEED SIGNAL CALIBRATING SYSTEM

Alfred P. deBuhr, Downers Grove; Bruce R. Meyer, Western Springs, and Robert J. Wilson, Bolingbrook, all of Ill., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 19, 1978, Ser. No. 917,073

Int. Cl.² B61C *15/08*

U.S. Cl. 318—52 **6 Claims**



1. A system for calibrating an electrical signal representation of the speed of rotation of a rotating element that is suitable for use with a self-propelled vehicle driven by a prime mover including a rotating element operationally coupled to the vehicle drive train having a predetermined input to output drive train ratio, comprising:

means for producing a first electrical signal representation of vehicle ground speed;

means for modifying said first electrical signal representation by a drive train ratio factor in such a manner that said first electrical signal representation is converted into a second

electrical signal representation of the theoretical speed of rotation of said prime mover rotating element based upon vehicle ground speed;

means responsive to selected prime mover operating parameters for producing a third electrical signal representation of a calculated speed of rotation of said prime mover rotating element;

means responsive to selected vehicle and prime mover operating parameters for producing a calibrate signal only while all of said selected operating parameters are satisfied; and

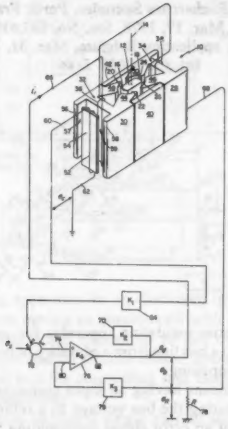
means for establishing during each said calibrate signal a calibration factor for said second electrical signal representation and for modifying said second electrical signal representation by said calibration factor in such a manner that said second electrical signal representation is converted into a calibrated system output electrical signal representation of the actual speed of rotation of said prime mover rotating element based upon vehicle ground speed, said means being responsive to said calibrate signal, said calibrated system output electrical signal representation and said third electrical signal representation and being effective to establish the said calibration factor required to modify said second electrical signal representation in such a manner that said calibrated system output signal representation and said third electrical signal representation are representative of substantially the same quantity.

4,186,332

LIMITED ROTATION MOVING IRON MOTOR WITH NOVEL VELOCITY SENSING AND FEEDBACK

Jean I. Montagu, Brookline, Mass., assignor to General Scanning Inc., Watertown, Mass.

Filed May 22, 1978, Ser. No. 908,400
Int. Cl.² H02K *33/00*
U.S. Cl. 318—128 **11 Claims**



1. In combination, a limited rotation moving iron electromagnetic motor and a device for providing a voltage indicating the angular velocity of rotation of the armature of said motor, said motor comprising a rotatable armature of ferromagnetic material mounted for rotation about an axis, a stator adjacent to said armature, a stationary permanent magnet, and a stationary drive coil through which a drive current flows, and means for elastic angular restraint attached to said armature wherein said stator, magnet, armature, and drive coil are arranged to apply permanent magnet biasing flux and to apply magnetic flux produced by said drive current to rotate said armature from said neutral position in an amount and direction dependent upon the flow of said drive current and the stiffness of said elastic restraint,

said device comprising:

means for providing a first voltage dependent upon said angular velocity of said armature, the self-inductance of said drive coil, and said drive current,

a compensation coil magnetically coupled through a gap to said drive coil and magnetically isolated from the effects of said rotating armature to provide a second voltage,

said second voltage appearing across said compensation coil and being dependent upon mutual inductance between said compensation coil and said drive coil and upon said drive current,

said second voltage being substantially unaffected by angular velocity of rotation of said armature due to said magnetic isolation of said compensation coil from the effects of said rotating armature, and

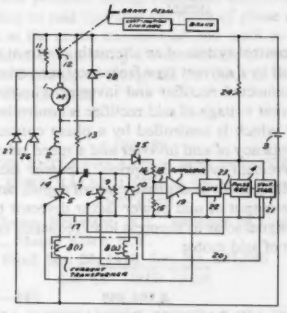
combining means for proportionally combining said first and second voltages to provide said voltage indicating said angular velocity of rotation.

4,186,333

CIRCUIT FOR THE ENERGY-CONSERVING BRAKING OF A DIRECT-CURRENT SERIES-WOUND MOTOR ESPECIALLY FOR VEHICLES

Manfred Kremer, Hamburg, Fed. Rep. of Germany, assignor to Still GmbH, Hamburg, Fed. Rep. of Germany

Filed Apr. 7, 1977, Ser. No. 785,691
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1976, 2615204
Int. Cl.² H02P *3/14*
U.S. Cl. 318—376 **4 Claims**



1. A circuit for the braking of an electrically powered vehicle by transforming braking energy into electrical energy and collecting said electrical energy, said circuit comprising:

a battery;

a series direct-current motor having an armature connected in series with a field winding connectible to said battery;

a main thyristor having its anode-cathode terminals connected in series with said motor across said battery;

a resistor connected in series with said motor across said battery;

a switch connected in parallel to said resistor;

a quenching capacitor connected to a junction between said motor and said thyristor;

commutator means in circuit with said capacitor for controlling the quenching of said thyristor;

voltage-sensing means connected between said junction and the cathode of said thyristor and responsive to the voltage of said capacitor for operating said commutator means;

a free-running diode connected across said motor and said resistor;

a braking diode connected across said battery and said resistor; and

a third diode connected across said armature and said resistor,

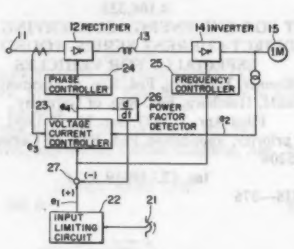
said commutator means comprising a second thyristor having an anode and a cathode said capacitor being bridged across the anodes of said thyristors, the cathode of said second thyristor being connected to the cathode of said main thyristor, each of said thyristors being connected in series with respective windings of a current transformer, said circuit further comprising a gate network responsive to said voltage-sensing means and connected to the gate of said main thyristor for controlling same.

4,186,334

CONTROL SYSTEMS OF ALTERNATING CURRENT MOTORS

Akio Hirata, Koganei, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Feb. 7, 1978, Ser. No. 875,897
Int. Cl.[2] H02P 7/36
U.S. Cl. 318—805 **4 Claims**



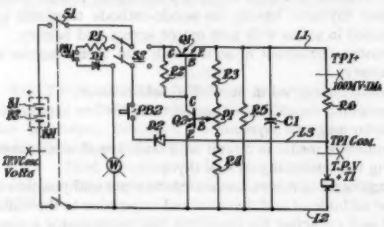
1. In a control system of an alternating current motor which is energized by a current type frequency converter including a serially connected rectifier and inverter wherein the output direct current voltage of said rectifier is controlled by a phase controller which is controlled by a phase control signal, the output frequency of said inverter and a speed reference signal, the improvement which comprises a power factor detector which differentiates said phase control signal, and means for adding the output of said power factor detector to said speed reference signal so as to suppress low frequency oscillations of the torque of said motor.

4,186,335

HEARING AID BATTERY RECHARGING APPARATUS

Harold J. Cahill, Wilmington, Del., assignor to Cahill Enterprises, Inc., Wilmington, Del.

Filed Sep. 21, 1977, Ser. No. 835,344
Int. Cl.[2] H02J 7/04
U.S. Cl. 320—3 **5 Claims**



1. An electrical recharging apparatus for hearing aid batteries of the silver oxide and mercurous oxide types comprising, in electrical circuit in the order recited:

(a) a dry cell charging source supplying, across its output terminals, a charging potential of, nominally, 3 volts,

(b) an "ON-OFF" double pole single throw switch having switching contacts interposed in series with each of said charging source output terminals,

(c) a preselected charging current-controlling resistor,

(d) hearing aid battery charging contacts connected at corresponding polarity sides with said output terminals of said charging source and with said hearing aid battery to be charged via said preselected charging current-controlling resistor and said "ON-OFF" switch, and

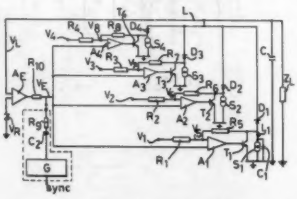
(e) a voltage regulating circuit connected in shunt with said battery charging contacts past said "ON-OFF" switch comprising a first transistor connected via its collector and emitter elements, respectively, in series relationship between said charging source and one charging contact for said hearing aid battery in a polarity sense maintaining charging current flow through the collector-emitter pair of said first transistor, a preselected biasing resistor, a second transistor connected with its collector element in circuit with the base element of said first transistor and with the collector element of said first transistor via said preselected biasing resistor which, in conjunction with said second transistor, limits the base-emitter current of said first transistor, a potentiometer, the emitter element of said second transistor connected to the appropriate polarity side of said charging source and the base element of said second transistor connected to the tap of said potentiometer which is connected from emitter element to emitter element of said transistors in shunt across said battery charging contacts.

4,186,336

LIMIT CYCLING REGULATOR APPARATUS FOR PLURAL PARALLEL POWER SOURCES

Alan H. Weinberg, Sassenheim, and Dermot M. O'Sullivan, Leiderdorp, both of Netherlands, assignors to Organisation Europeenne de Recherches Spatiales, Paris, France

Filed Mar. 17, 1978, Ser. No. 887,610
Claims priority, application Belgium, Mar. 31, 1977, 176327
Int. Cl.[2] G05F 1/46
U.S. Cl. 323—15 **3 Claims**



1. A shunt or series regulating apparatus for controlling the current supplied to a bus line from a plurality of power sources, said apparatus comprising:

error detector means having an input connected to the bus line for comparing the bus voltage to a reference voltage and producing an error signal representing the deviation of said bus voltage from the reference voltage;

a plurality of dump switching means each connected in parallel with a respective power source, each of said dump switching means having an ON and an OFF state and being responsive to a control signal for switching from its OFF state to its ON state thereby to shunt the current delivered by said power source to the bus line;

a plurality of comparator means each associated to a respective power source, each of said comparator means having a first input connected to the output from said error detector means and a second input connected to a respective reference voltage level, each of said comparator means having its output connected to the control input to a

respective of said dump switching means for applying a control signal thereto which is proportional to the difference between the said error signal and the said reference voltage level;

a plurality of positive feedback circuit means each connected between the output of the respective power source and the second input to the corresponding comparator means for superimposing a signal to the reference voltage level, thereby to set two operation thresholds for the said comparator means, such that each dump switching means is allowed to switch cyclically between its two states, thereby to allow the current from the corresponding power source to be fed into the bus line when the dump switching means is OFF and to short the power source when the dump switching means is ON; and

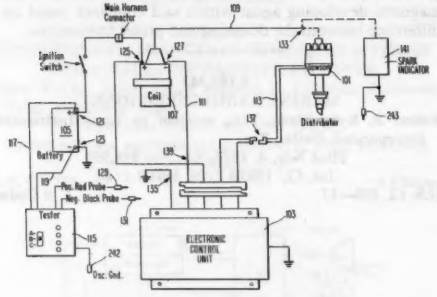
capacitor means connected between the bus line and the ground in order that its charge follows at any time the variation of the total current drawn from the plurality of power sources into the bus line such that one of said switching means at a time is caused to switch cyclically between its two states and such that said switching means are caused to switch cyclically one after another as the value of said error signal is increasing.

4,186,337

ANALYZER FOR TRANSISTOR IGNITION SYSTEM

Richard G. Volk, York, Pa., and Frank J. Muellner, Chicago, Ill., assignors to K-D Manufacturing Company, Lansdale, Pa.

Filed Dec. 12, 1977, Ser. No. 859,434
Int. Cl.[2] F02P *17/00*
U.S. Cl. 324—380 **14 Claims**



1. A testing apparatus for an electronic ignition system, this ignition system having an ignition coil with a spark output, an electronic control unit connected to said coil for controlling said coil output and an electric sensor connected to said electronic control unit for controlling said electronic control unit operation, comprising:

circuit means having a single pair of input probes one of which being the active probe and the other the ground probe for alternate connection to said electric sensor, said electronic control unit and said ignition coil for providing both static and dynamic substitute signals thereto via said pair of probes for determining via "go", "no-go" display components included therein the condition of operation, said circuit including reverse polarity protection means, and selection means whereby continuity, isolation and impedance testing can be selectively conducted; and

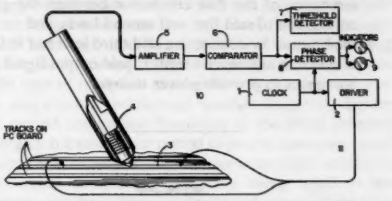
spark indicator means connectable between said ignition coil output and ground in conjunction with said connection of said circuit means to said ignition coil for providing a signal indication of the operation of said ignition coil.

4,186,338

PHASE CHANGE DETECTION METHOD OF AND APPARATUS FOR CURRENT-TRACING THE LOCATION OF FAULTS ON PRINTED CIRCUIT BOARDS AND SIMILAR SYSTEMS

Matthew L. Fichtenbaum, Chelmsford, Mass., assignor to GenRad, Inc., Concord, Mass.

Filed Dec. 16, 1976, Ser. No. 751,103
Int. Cl.[2] G01R *31/08*
U.S. Cl. 324—52 **4 Claims**



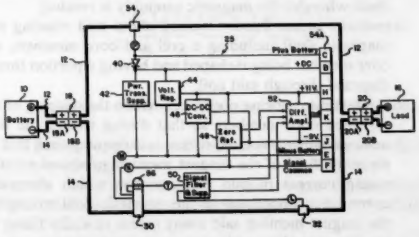
1. A method of current-tracing the location of a short circuit fault between a pair of conductive tracks among closely disposed tracks on a printed circuit board, that comprises, connecting a pair of signal leads to said pair of tracks, respectively, applying to said pair of tracks, via said signal leads, an a.c. test excitation signal that follows a conductive path from one signal lead to the other signal lead via said pair of tracks and said short circuit fault and that generates a magnetic field about the path; deliberately moving a probe held in the hand of a human operator back and forth across and along one of said pair of tracks in the proximity of said path in a zig-zag manner to pick up said field and produce voltages induced therefrom; repetitively indicating to said operator the point of phase change of said voltages as the probe crosses said one track to pin point said one track; and continuing the movement of the probe to trace the path of said signal along said one track to the location of said short circuit fault.

4,186,339

METHOD AND APPARATUS FOR MEASURING CURRENT, ESPECIALLY USEFUL IN MULTI-AMPERE SYSTEMS

Eugene P. Finger, Brewster, N.Y., assignor to Curtis Instruments, Inc., Mount Kisco, N.Y.

Filed Jan. 20, 1978, Ser. No. 871,095
Int. Cl.[2] G01R *21/06*
U.S. Cl. 324—142 **13 Claims**



1. Apparatus for measuring current flow through a pair of electrical conductors which connect a load to a pair of terminals of an electrical power source, said apparatus comprising:

first and second electrical leads connected to a first conductor in said pair at spaced apart points on said conductor;

a third lead connected to a second conductor in said pair;

temperature compensating means mounted on said first conductor at a point such that said means is at approxi-

mately the same temperature as that portion of the conductor between said first and second leads;

means for producing in response to signal inputs thereto an electrical output signal representative of the current flow through said first conductor;

first means for connecting said first and second leads and said temperature compensating means to said output signal producing means to provide signal inputs thereto, said temperature compensating means being connected so as to substantially offset temperature induced changes in the resistance of the first conductor between the points of connection of said first and second leads; and

second means for connecting said third lead and at least one of said first and second leads to said output signal producing means to provide power thereto.

4,186,340

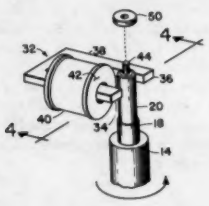
APPARATUS FOR MEASURING THE MAGNETIC STRENGTH OF MAGNETIC WORK PIECES

Harry daCosta, and Paul L. Krichbaum, both of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 591,265, Jun. 30, 1975, abandoned. This application Sep. 7, 1976, Ser. No. 720,856

Int. Cl.[2] G01R *33/12*

U.S. Cl. 324—205 **7 Claims**



1. Apparatus for measuring the relative magnetic field strength of a miniature permanent magnet assembly, comprising in combination:

a nonmagnetic shaft having a reduced end portion in which is formed a cavity;

insert means adapted to receive the magnet assembly during test, said insert means being positioned within said cavity of said reduced portion of said shaft;

means attached to the other end of said shaft for rotating said shaft whereby the magnetic assembly is rotated;

transducer means fixedly located about said rotating nonmagnetic shaft including a coil and core members, said core member being u-shaped and having a portion thereof disposed through said coil;

said insert means being positioned within the opening of said u-shaped core members so that during testing the magnetic assembly is rotated within said opening such that the magnetic field of the magnet member produces an alternating current in said coil member which alternating current is proportional to the magnetic field strength of the magnet member said insert means spatially fixing the magnet assembly with respect to said opening of said u-shaped core member to establish a magnetic circuit comprising the magnet assembly and said u-shaped core member having only two air gaps therein whereby the efficiency of said magnetic circuit is increased; and

means coupled to said coil member and being responsive to said alternating current for visually displaying a parameter indicative of the relative magnetic field strength of the magnetic workpiece being tested.

4,186,341

MAGNETIC DEVELOPING AGENT LEVEL DETECTION APPARATUS USING AN OSCILLATOR WHOSE FREQUENCY IS CONTROLLED BY THE LEVEL

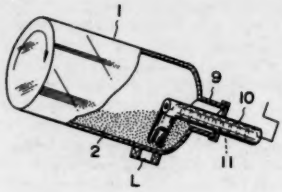
Koichi Noguchi, Machida, and Kunio Hibi, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Mar. 8, 1978, Ser. No. 884,532

Claims priority, application Japan, Mar. 10, 1977, 52-25406; Mar. 10, 1977, 52-25407; Mar. 10, 1977, 52-25408

Int. Cl.[2] G01F *23/28*

U.S. Cl. 324—236 **10 Claims**



1. An apparatus for determining the residual amount of a magnetic developing agent comprising, in combination, a container, of non-magnetic material, to contain the magnetic developing agent, said container arranged in a tilted position and mounted for rotation; an oscillator including at least one detection coil serving as a resonance element thereof for producing a detection frequency, said at least one detection coil being arranged in juxtaposition against the lowermost portion of said container; and a detection circuit connected to said oscillator, including means for producing a preset frequency, and including means for comparing the detection frequency with the preset frequency for determining the residual amount of the magnetic developing agent within said container based on a difference between the detection and preset frequencies.

4,186,342

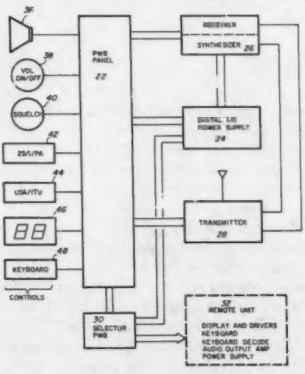
MARINE RADIO TELEPHONE

Robert R. Kyle, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 4, 1977, Ser. No. 848,559

Int. Cl.[2] H03B *3/08*; H04B *1/40*

U.S. Cl. 325—17 **9 Claims**



1. A radio telephone comprising:

(a) a keyboard channel selector including a plurality of switch circuits including a switch circuit for each of the digits "0" through "9", the digit switch circuits each having a numbered pressable key switch for producing a

binary logic indicating signal whereby a channel is selected by sequentially pressing keys for the ten digit and unit digit;

(b) a counter means for producing a binary coded count;

(c) a digital keyboard detector connected to the counter means for receiving the binary coded count and to the keyboard for scanning the keyboard circuits to detect a pressed key and generating a pressed key indicating signal stopping the counter means to hold the count representing the pressed key for a channel selection;

(d) a load control means connected to the digital keyboard detector for receiving the pressed key indicating signal and producing alternating load signals;

(e) a tens register and a units register connected to the load control and counter means, the tens and units registers operatively responsive to the load signals of the load control means to store the binary coded count sequentially into the tens and units registers;

(f) a memory connected to the tens and units registers for receiving the binary coded numbers of the tens and units registers and producing a corresponding synthesizer address code;

(g) a synthesizer connected to the memory for receiving the synthesizer address code and producing the frequency of the selected channel;

(h) an electroacoustic transducer selectively connected to the synthesizer for modulating the channel selection frequency:

(i) a receiver having a heterodyning stage connected to the synthesizer for selectively receiving the channel selection frequency as a local oscillator frequency, and producing audio frequency electric power; and

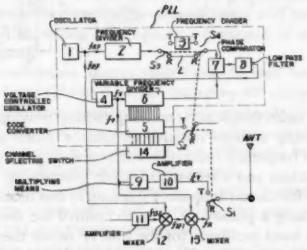
(j) a transmitter alternatively connected to the synthesizer for transmitting a modulated radio frequency signal over the selected channel.

4,186,343

SYNCHRONOUS FREQUENCY SYNTHESIS METHOD FOR A RADIO TRNSMITTER-RECEIVER

Takao Kakigi, Inagi, Japan, assignor to Cybernet Electronic Corp., Kanagawa, Japan

Filed May 3, 1977, Ser. No. 793,301
Claims priority, application Japan, Oct. 5, 1976, 51-119611
Int. Cl.[2] H04B 1/38
U.S. Cl. 325—17 **4 Claims**



1. A synchronous frequency synthesis method for a radio transmitter receiver having a double superheterodyne receiving stage, which comprises the steps of:

applying a reference frequency outputted from a fixed-frequency oscillator to a fixed frequency divider and to a second mixer for converting said reference frequency into a second intermediate frequency of said double superheterodyne receiving stage,

dividing down a controlled frequency outputted from a voltage-controlled oscillator by a variable frequency divider,

feeding said divided-down controlled frequency to a phase detector,

multiplying said controlled frequency to produce a transmitting carrier frequency,

applying said controlled frequency to a first mixer of said double superheterodyne receiving stage for converting said controlled frequency into a first intermediate frequency of said double superheterodyne receiving stage,

applying a divided frequency outputted from said fixed frequency divider as a first comparison frequency directly to the phase detector in each reception period to produce an error signal to alter the output of the voltage-controlled oscillator, said first comparison frequency being equal to the frequency of the voltage-controlled oscillator at the time of reception divided by a first frequency division step number and through another frequency divider as a second comparison frequency to the phase detector during each transmission period to produce an error signal to alter the output of the voltage-controlled oscillator, said second comparison frequency being equal to the frequency of the voltage-controlled oscillator at the time of transmission divided by a second frequency division step number, and

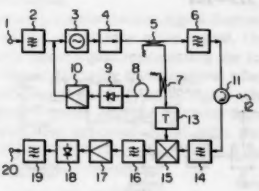
inputting one of the two frequency division step numbers to a shift-applying code converter to increase the one of the two frequency division step numbers by a value equal to the difference between said two frequency division step numbers so as to obtain the other of the two frequency division step numbers, and feed the resulting step number as a command code to said variable frequency divider.

4,186,344

FREQUENCY CONVERTER

Michio Higuchi, and Masayasu Hata, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Dec. 14, 1977, Ser. No. 860,459
Claims priority, application Japan, Dec. 27, 1976, 51/156280
Int. Cl.[2] H04B 1/50
U.S. Cl. 325—20 **6 Claims**



1. A frequency converter comprising a single diode oscillator,

a DC power supply being superposed with the intermediate frequency signal,

a cavity resonator connected to the output of the diode oscillator for providing self-injection-locking to the diode oscillator,

means connected to the output of said resonator to extract both the local frequency for the receiver and a pair of side bands,

means for transmitting one of said side bands,

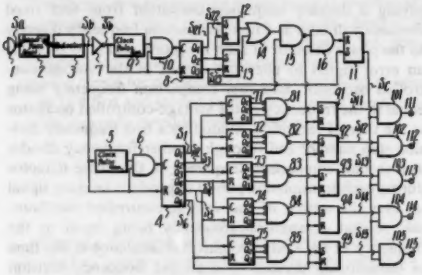
a mixer to receive the receiving signal and said local frequency to convert the receiving signal to the receiving intermediate frequency, and

means for demodulating the receiving intermediate frequency to provide the receiving base band signal.

4,186,345
REMOTE CONTROL SYSTEM

Kouji Marita, Kodaira, and Takao Mogi, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 28, 1977, Ser. No. 846,445
Claims priority, application Japan, Nov. 5, 1976, 51-133520
Int. Cl.[2] H01R 13/50
U.S. Cl. 325—37 7 Claims



1. In a remote control system for selectively controlling a plurality of functions of an electrical apparatus, a receiver for receiving transmitted command signal comprised of a plurality of alternating mark periods and space periods between said mark periods, comprising;

detector means for detecting each said space period;

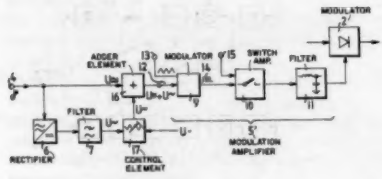
measuring means for measuring the length of said detected space period; and

decoding means for selecting at least one of said functions in response to the detection of a plurality of space periods of substantially equal measured length.

4,186,346
AMPLITUDE MODULATED TRANSMITTER

Bodo Wysocki, Berlin, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Fed. Rep. of Germany

Filed May 3, 1978, Ser. No. 902,483
Claims priority, application Fed. Rep. of Germany, May 10, 1977, 2720930
Int. Cl.[2] H04B 1/04
U.S. Cl. 325—144 8 Claims

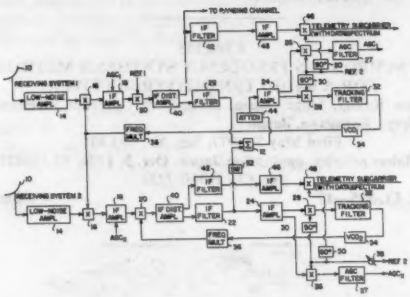


1. In an amplitude modulated transmitter having a transmitter modulation stage and adapted for use with a supplied modulation voltage having a transmitter modulation voltage period, and including a carrier control circuit adapted to control a carrier voltage so that the respective amplitudes of the carrier voltage carried within each transmitter modulation voltage period is reduced with decreasing amplitudes of the supplied modulation voltage, the carrier control circuit including a modulation voltage rectifier and filter connected to the supplied modulation voltage for producing a control magnitude for the transmitter modulation stage, which control magnitude is dependent on the volume of the modulation voltage, the improvement comprising, in combination, a modulation amplifier constituted by a switching amplifier for producing pulse duration modulated pulses, a modulation voltage-control pulse duration modulator connected to the input of said switching amplifier and a filter section connected to the output said switching amplifier; said carrier control circuit including deriving means connected to said modulation voltage rectifier and filter for deriving, from the modulation voltage supplied, said volume-dependent control magnitude; and means combining said volume-dependent control magnitude with the modulation voltage supplied to said rectifier and filter, the output of said combining means being coupled to said pulse duration modulator to change the pulse duty factor of the output pulses of said switching amplifier for carrier control of said transmitter.

4,186,347
RADIO FREQUENCY ARRAYING METHOD FOR RECEIVERS

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Milton H. Brockman, Glendale, and Mahlon F. Easterling, Altadena, both of Calif.

Filed Oct. 31, 1978, Ser. No. 956,160
Int. Cl.[2] H04B 7/02
U.S. Cl. 325—305 20 Claims



11. A radio frequency receiving facility moving a plurality of receiving systems coupled to one or more antennas for coherent frequency reception, each receiving system having a first IF mixer and a second IF mixer, comprising:

means for carrier frequency tracking in one receiving system utilizing a phase-lock loop to control the frequency of a first local oscillator for the first IF mixer thereof,

means for using the output of said first local oscillator as the local oscillator for the first IF mixer of each of the remaining systems,

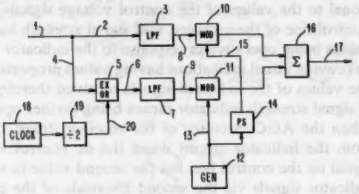
means for carrier phase tracking in each of said remaining receiving systems relative to said one receiving system at IF frequency using a constant reference frequency for the second IF mixer in said one receiving system, and in each remaining system using a phase-lock loop to control the frequency of a second local oscillator for the second IF mixer thereof, and

means for summing of the second IF signals in all of said remaining receiving systems with the second IF signal in said one receiving system.

4,186,348
RECEIVER FOR DATA TRANSMITTED BY MEANS OF THE INTERLEAVED BINARY PHASE SHIFT KEYED MODULATION TECHNIQUE

Alex H. Lautier, Nice, and Jean L. Monrolin, LaGaude, both of France, assignors to International Business Machines Corp., Armonk, N.Y.

Filed May 22, 1978, Ser. No. 908,186
Claims priority, application France, Jun. 10, 1977, 77 18762
Int. Cl.[2] H04B 1/16
U.S. Cl. 325—320 3 Claims



1. In a data transmission system employing an interleaved BPSK modulation technique wherein each bit to be transmitted at an even signaling instant is made to correspond to a selected one of a first pair of points differing in phase by 180° in the space diagram illustrating the state of the carrier being transmitted, and wherein each bit to be transmitted at an odd signaling instant is made to correspond to a selected one of a second pair of points differing in phase by 180°, and with the said first and second pairs of points being 90° apart in phase, a receiver characterized in that it includes:

input means adapted for receiving the signal from the transmission channel,

means responsive to the received signal for deriving a reference carrier from said received signal and providing said reference carrier and said reference carrier shifted by 90°,

first demodulation means responsive to said received signal and said reference carrier for demodulating said received signal and providing the in-phase component of said received signal,

second demodulation means responsive to said received signal and said reference carrier shifted by 90° and providing the quadrature component of said received signal,

first summing means responsive to said in-phase and quadrature components for providing the difference between said in-phase and quadrature components,

second summing means responsive to said in-phase and quadrature components for providing the sum of said in-phase and quadrature components,

first detection means responsive to the output from said first summing means for providing the sign of said difference between said components,

second detection means responsive to the output from said second summing means for providing the sign of said sum of said components,

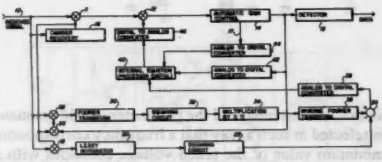
means responsive to said received signal for deriving from the received signal a clock signal at half the signaling rate, and

gating means responsive to said clock signal and the outputs of said first and second detecting means for selectively gating the sign of said sum of said components to the output of the receiver under control of said clock signal.

4,186,349
ADAPTIVE NARROW BAND NOISE ESTIMATOR/SUPPRESSOR RADIO RECEIVER

Robert S. Gordy, Largo; Ramon P. Chambers, Clearwater, and David E. Sanders, St. Petersburg, all of Fla., assignors to E-Systems, Inc., Dallas, Tex.

Filed Dec. 27, 1977, Ser. No. 864,768
Int. Cl.[2] H04B 1/10
U.S. Cl. 325—323 22 Claims



1. A receiver apparatus for extracting a data signal from a received signal which has included therein an interfering noise signal, comprising in combination:

(a) means for recovering a carrier signal from the received signal, the recovered carrier signal corresponding to the carrier signal modulated to carry the data signal,

(b) means for mixing the recovered carrier signal with the received signal to produce a baseband signal which includes both the data signal and the noise signal,

(c) means for generating a recovered modulated carrier signal by mixing the data signal with the recovered carrier signal,

(d) means for deriving the noise signal by mixing the recovered modulated carrier signal with the received signal,

(e) means for generating a noise correlation signal by operating on the derived noise signal, the noise correlation signal representing an approximation of the correlation of the noise signal over a sample period having a predetermined duration,

(f) means for generating a squared mean signal by operating on the baseband signal, the squared mean signal representing an approximation of the square of the mean of the noise signal over the sample period,

(g) means for generating a covariance noise signal by producing the difference of the noise correlation signal and the squared mean signal,

(h) means for generating a noise statistic signal derived from a combination of the covariance noise signal, the data signal, and a noise figure signal representing the receiver apparatus noise figure, the noise statistic signal adapted to reduce the interfering effect of the noise signal when the noise statistic signal is mixed with the baseband signal, and

(i) means for mixing the baseband signal with the noise statistic signal to produce the data signal having the noise signal essentially removed therefrom.

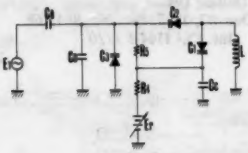
4,186,350
ANTENNA TUNING CIRCUIT

Kazuo Takayama, Kobe, Japan, assignor to Fujitsu Ten Limited, Kobe, Japan

Filed Apr. 13, 1978, Ser. No. 895,963
Claims priority, application Japan, Apr. 19, 1977, 52-44695; Aug. 19, 1977, 52-100032; Aug. 19, 1977, 52-100033
Int. Cl.[2] H04B 1/10
U.S. Cl. 325—383 5 Claims

1. An antenna tuning circuit of an electronic tuning type radio receiver having a first variable capacitance diode connected in parallel with a coil to form a resonance circuit and a second variable capacitance diode which connects the coil to an antenna and whose capacitance value is adjusted in company with the capacitance value of the first variable capacitance diode, wherein one end of said coil is grounded together with one end of said first variable capacitance diode by way of

a capacitor having a relatively large capacitance, a tuned voltage is taken out from both ends of said capacitor, the other end of said coil is connected by way of said second variable capaci-



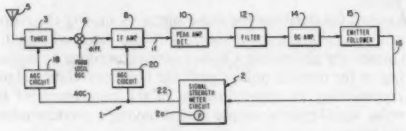
tance diode to the antenna, and the parameter of said resonance circuit is selected in such a way that a frequency corresponding to the minimum value of the tuned voltage coincides with an image frequency to be eliminated.

4,186,351

SIGNAL STRENGTH INDICATOR CIRCUIT FOR A RADIO RECEIVER EMPLOYING AGC

Gary P. Brefini, Winchester, and Francis H. Stites, Wayland, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Nov. 1, 1978, Ser. No. 956,535
Int. Cl.[2] H04B 1/26
U.S. Cl. 325—398 **8 Claims**



1. A signal strength indicator circuit for a radio receiver employing AGC, said radio receiver being adapted to receive signals from a transmitter and operative in the absence of signals received from the transmitter to produce on a control line thereof a dc control voltage signal of a first value and in response to signals received from the transmitter to produce on the control line thereof dc control voltage signals of values in a range between the first value and a second value, said radio receiver further including AGC circuitry operative to draw current from the signal strength indicator circuit when a dc control voltage signal on the control line has the second value, said signal strength indicator circuit comprising:

an input terminal coupled to the control line of the radio receiver and adapted to receive each dc control voltage signal on the control line of the receiver;

an output terminal coupled to the AGC circuitry of the receiver;

signal strength indicator means;

a control device having first, second and third electrodes, the first electrode being coupled to the output terminal and the second electrode being coupled to the signal strength indicator means;

first resistance means connected in series with the input terminal and the third electrode of the control device;

second resistance means coupled between the input terminal and the output terminal and in parallel with the first resistance means and the control device; and

reference circuit means coupled to the output terminal, said reference circuit means being operative when a dc control voltage signal on the control line of the receiver has the first value indicative of the absence of signals received by the receiver from a transmitter to produce a dc voltage signal at the output terminal of essentially the same value as the dc control voltage signal on the control line of the receiver;

said reference circuit means, said first and second resistance means and said control device being operative in response to dc control voltage signals on the control line of the receiver within the range of values between the first and second values and indicating the receipt by the receiver of signals from a transmitter to establish dc voltage signals at the output terminal having values related to the values of the dc control voltage signals on the control line of the receiver, and further operative to supply indicator signals via the second electrode of the control device to the signal strength indicator means having values directly proportional to the values of the control voltage signals on the control line of the receiver, said signal strength indicator means being operative in response to the indicator signals to provide visual indications having values proportional to the values of the indicator signals received thereby; and

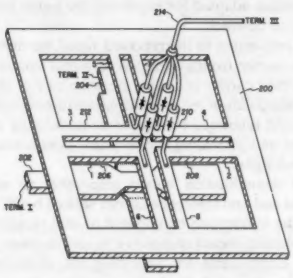
said signal strength indicator means being further operative when the AGC circuitry of the receiver draws current from the indicator circuit when the dc control voltage signal on the control line has the second value to receive indicator signals via the second electrode of the control device and to provide visual indications having values proportional to the values of the indicator signals.

4,186,352

SIGNAL CONVERTER APPARATUS

Ben R. Hallford, Wylie, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 23, 1978, Ser. No. 889,171
Int. Cl.[2] H04B 1/26; H01P 5/10, 5/16
U.S. Cl. 325—446 **14 Claims**



12. The method of providing signal frequency conversion comprising the steps of:

coupling input pump signals from a first single conductor means to first and second pairs of conductive paths juxtaposed opposing sides of said first single conductor means;

coupling signals between third and fourth pairs of conductive paths to opposite sides of a juxtaposed second single conductor means for providing converted output signals;

inputting nonlinear intermediate frequency signals of a first polarity to one conductor of each of said pairs of conductive paths; and

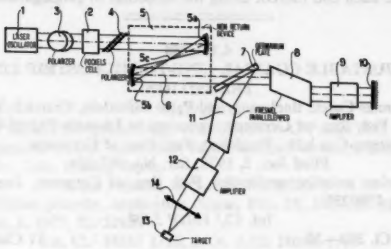
inputting nonlinear intermediate frequency signals of a second polarity to the remaining conductor of each of said pairs of conductive paths, said pairs of conductive paths connected to and extending from a ground plane means.

4,186,353

LASER AMPLIFICATION SYSTEM

Jean-Louis Boutineau, Palaiseau, France, assignor to Compagnie General d'Electricite, Paris, France

Filed Aug. 28, 1978, Ser. No. 937,375
Claims priority, application France, Sep. 8, 1977, 77 27181
Int. Cl.[2] H01S 3/23, 3/10
U.S. Cl. 330—4.3 8 Claims



1. A laser amplification system comprising:

a laser oscillator disposed along a first axis, said oscillator being provided with a modulator constituted by an electro-optical cell and at least one polarizer so that the light beam which leaves the oscillator is polarized in a first plane;

an optical component disposed on the first axis at the output of the laser oscillator, said component being capable of allowing the light beam linearly polarized in the first plane to pass;

a first laser amplifier disposed at the output of the optical component;

a first optical transformer disposed optically in series with the first laser amplifier, said transformer being of a type which is capable of changing the linear polarization of the beam which it receives into circular polarization;

a reflector disposed so as to return the beam which has passed through the first amplifier in the direction from which it came, the return beam being polarized in a second plane perpendicular to the first plane after having passed through the first optical transformer and the first amplifier, in the opposite direction, at least a part of the energy polarized in the second plane being reflected by the optical component along a second axis which is different from the first axis; and

a second laser amplifier disposed on the second axis for said part of the energy of the beam reflected by the optical component to pass through it;

the improvement wherein:

said optical component is a first optical plate made of a material which is transparent to the light of the beam, said first optical plate being inclined at the Brewster angle in the first plane in relation to the beam which leaves the oscillator, said first optical plate reflecting the greater part of the energy of the beam polarized in the second plane along the second axis and allowing the other part of the energy of this beam to pass;

and wherein said system also includes:

a second optical transformer of said type, disposed on the second axis; and

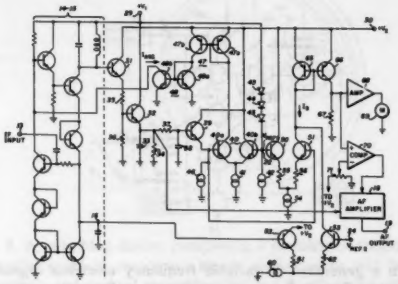
a non-return device disposed between the oscillator and the first optical plate said non-return device being capable of absorbing said other part of the energy of the beam polarized in the second plane and of allowing the laser beam which leaves the oscillator to pass.

4,186,354

SUMMING AMPLIFIER FOR DEVELOPING A SQUELCH AND METER VOLTAGE IN A RADIO RECEIVER

Ronald W. Page, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 861,160, Dec. 16, 1977, Pat. No. 4,143,331.
This application Sep. 29, 1978, Ser. No. 947,662
Int. Cl.[2] H03F 3/68, 3/45
U.S. Cl. 330—252 3 Claims



1. A summing amplifier for producing an output responsive to a discontinuous input function obtained from a plurality of signal sources, said output having a continuous character in relation to a single parameter, said amplifier comprising:

a first differential amplifier having an output, a first reference input and a first variable signal input;

a second differential amplifier having an output, a second reference input independent from said first reference input and a second variable signal input;

means for coupling said outputs of said first and second differential amplifiers to a common output load;

means for coupling said first and second variable signal inputs to first and second signal sources, said sources having a discontinuous relation to a single parameter; and

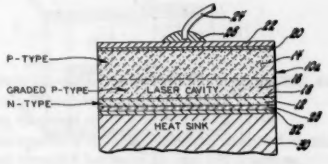
means for coupling said first and second reference inputs to first and second independent reference potentials, said potentials being selected in relation to said first and second signal sources.

4,186,355

SEMICONDUCTOR DIODE LASER WITH INCREASED FREQUENCY TUNING RANGE

Wayne Lo, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 31, 1978, Ser. No. 892,188
Int. Cl.[2] H01S 3/19
U.S. Cl. 331—94.5 H 7 Claims

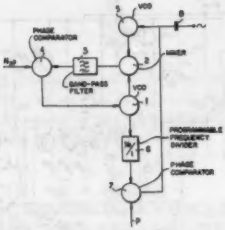


1. In a lead-salt semiconductor diode laser having a PN junction and contiguous laser cavity, the improvement wherein said laser cavity has a non-homogeneous majority current carrier concentration generally normal to said PN junction effective to significantly increase the frequency range within which said laser can be tuned.

4,186,356
PHASE LOCKED LOOP FREQUENCY SYNTHESIZER AND FREQUENCY MODULATOR

Joël Rémy, Paris, France, assignor to Adret Electronique, Trappes, France

Filed Apr. 18, 1978, Ser. No. 897,602
Claims priority, application France, Apr. 20, 1977, 77 12646; Jun. 17, 1977, 77 19354
Int. Cl.[2] H03B 3/04; H03C 3/02
U.S. Cl. 332—19 6 Claims

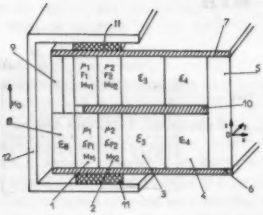


1. In a generator of variable frequency electrical signals comprising first and second oscillators, a frequency mixer having first and second inputs and an output, the first oscillator delivering an output frequency and feeding the first input of the frequency mixer, the second oscillator feeding the second input of the said frequency mixer and feeding also a frequency divider with programmable ratio, a first phase comparator having a first input connected to the output of the said frequency mixer and a second input receiving an intermediate frequency including a variable increment, a second phase comparator receiving the output of the frequency divider and a reference signal, the improvement that the output of the first comparator is connected to the second oscillator in order to control its frequency, and the output of the second comparator is connected to the first oscillator in order to control its frequency.

4,186,357
NON-RECIPROCAL MICROWAVE PHASE SHIFTERS OPERATING IN A WIDE BAND ON EDGE MODE

Gérard Forterre, and Jean Marcoux, both of Paris, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed Mar. 9, 1978, Ser. No. 884,731
Claims priority, application France, Mar. 18, 1977, 77 08176
Int. Cl.[2] H01P 1/40
U.S. Cl. 333—24.1 5 Claims

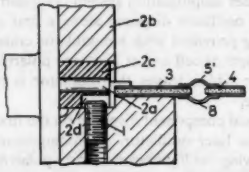


1. A stripline edge mode microwave phase shifter having a band width greater than two octaves comprising a central conductor, two external conductors parallel to the central conductor and two gyromagnetic slabs located one on each side of said central conductor so that a first edge of said slabs protrudes from said central conductor, two identical composite propagation media one on each side of said central conductor and located along a second edge of said slabs consisting of high permittivity dielectric slabs and a lump impedance and two different propagation media located along said first edge of said gyromagnetic slabs, the first of said media being a dielectric slab the permittivity of which is equal to that of the gyromagnetic medium and the second of which being lump discrete loads located by the side of said gyromagnetic slab along the direction of propagation, means for establishing a magnetizing field higher than the saturation field within said gyromagnetic slabs, means closing said magnetizing field, and means affording electrical connection to said central conductor at each end thereof along the direction of propagation.

4,186,358
ADJUSTABLE COAXIAL LINE-TO-MICROSTRIP LINE TRANSITION

Johannes Czech, Backnang, and Peter Dörntlein, Dreieich, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltung-G.m.b.H., Frankfurt, Fed. Rep. of Germany

Filed Jan. 5, 1978, Ser. No. 867,034
Claims priority, application Fed. Rep. of Germany, Jan. 5, 1977, 2700231
Int. Cl.[2] H01P 5/08
U.S. Cl. 333—33 11 Claims

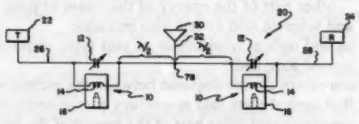


1. A transition device for connecting a coaxial cable to a planar line of an integrated microwave circuit disposed on a substrate, said device comprising: a coaxial plug connector terminating the coaxial cable and having a plug member connected to an inner conductor of the coaxial cable; a tuning screw arranged to be adjusted to control the electrical parameters of said device; an intermediate carrier carrying a planar intermediate line connected to said plug member of said connector, said intermediate carrier forming a fixed unit with said plug connector and being spaced from said substrate by a gap; a housing supporting said fixed unit and said substrate; and a metal band connecting together said planar intermediate line and said planar line of said microwave circuit thereby bridging said gap, said metal band compensating for the effects of thermal expansion of said substrate relative to said intermediate carrier.

4,186,359
NOTCH FILTER NETWORK

Daniel P. Kaegebein, Depew, N.Y., assignor to TX RX Systems Inc., Angola, N.Y.

Filed Aug. 22, 1977, Ser. No. 826,412
Int. Cl.[2] H01P 7/04, 7/06, 1/20
U.S. Cl. 333—134 31 Claims



1. An electrical filter network for selectively attenuating and passing first and second predetermined closely spaced frequen-

cies respectively when inserted in series in a transmission line, said filter network comprising in combination:

(a) a reactive circuit adapted to be series connected in said transmission line and tuned to be parallel resonant at said first predetermined frequency; and p1 (b) a cavity resonator whose internal field is inductively coupled with said reactive circuit, said cavity resonator being resonant at said second predetermined frequency.

4,186,360

DIGITAL CHANNEL SELECTING APPARATUS

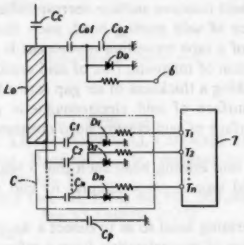
Tadamasa Ohashi, Takatsuki, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Feb. 21, 1978, Ser. No. 879,510

Claims priority, application Japan, Feb. 18, 1977, 52-18519; Mar. 1, 1977, 52/22931

Int. Cl.² H03J *3/20, 3/06, 5/02;* **H04B** *1/06*

U.S. Cl. 334—55 **17 Claims**



1. A digital channel selecting apparatus for selecting a channel among a plurality of television channels which are distributed in at least a relatively higher and lower frequency regions, comprising:

tuning circuit means including a reactance component consisting of a fixed reactance component and a variable reactance component,

automatic frequency control means coupled to said tuning circuit for correcting frequency deviations therein, said automatic frequency control means having a predetermined maximum frequency correction,

said variable reactance component including a plurality of capacitance elements coupled in parallel with each other,

a plurality of switching means individually coupled to said plurality of capacitance elements for coupling parallel combinations of said capacitance elements into said tuning circuit means, wherein the minimum difference between the value of said combinations of said capacitance elements is less than the capacitive value which produces the predetermined maximum frequency correction of said automatic frequency control means,

selection circuit means for generating a coded digital control signal for selectively enabling at least one of said plurality of switching means to thereby tune said tuning circuit means by selectively coupling into said tuning circuit means at least one of said plurality of capacitance elements corresponding to the channel being selected, and

means for varying the reactance value of said fixed reactance component in said tuning circuit means for switching said tuning circuit means between said higher and lower frequency regions.

4,186,361

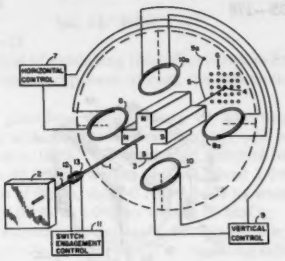
FLUID (LIQUID OR GAS) OR ELECTRICALLY CONTROLLED MULTIPURPOSE SWITCH

Leon H. Riley, 7707 Logan Dr. SW., Huntsville, Ala. 35802

Filed Apr. 19, 1978, Ser. No. 897,615

Int. Cl.² H01H *9/00, 57/00, 59/00*

U.S. Cl. 335—179 **6 Claims**



1. A switching device comprising a plurality of terminals; a floating contact; responsive means connected to said floating contact; and control means located in a fixed spatial relationship to said terminals and in a spatial relationship to said responsive means so as to position said responsive means such that a select one of said plurality of terminals is engaged by said floating contact; wherein said responsive means are electrostatic plates; and said control means are electrostatic plates.

4,186,362

SWITCH

Mikio Kondo, and Tadashi Yoshimura, both of Tsu, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jun. 28, 1977, Ser. No. 810,847

Claims priority, application Japan, Jun. 29, 1976, 51/77638

Int. Cl.² H01H *9/00*

U.S. Cl. 335—205 **9 Claims**

1. A switch for detecting separation between first and second relatively movable parts, comprising:

a housing mounted on one of said parts;

a magneto-sensitive switching element mounted in said housing and movable between on and off positions,

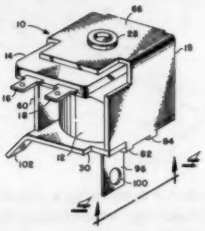
a rotatable permanent magnet mounted in said housing adjacent said switching element for actuating the latter, said rotatable permanent magnet being mounted for rotation about a fixed vertical axis located intermediate the ends of said rotatable permanent magnet; and

an actuating means mounted on the other of said parts for establishing a magnetic field which causes rotation of said rotatable permanent magnet.

4,186,363
SOLENOID ASSEMBLY FOR ELEVATED TEMPERATURE SERVICE

John Schmidt, Jr., Mount Prospect, and Donald E. Martin, North Aurora, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 825,806, Aug. 18, 1977, abandoned. This application Jul. 26, 1978, Ser. No. 928,122
Int. Cl.² H01F 7/16
U.S. Cl. 335—278 22 Claims



1. A solenoid assembly for elevated temperature service comprising:

(a) a housing formed of insulating material and having a bore therethrough and having a terminal cover portion integrally formed at one end thereof and extending therefrom in a transverse direction to said bore, said cover portion having a certain surfaces thereof adapted for locating and registering electrical connectors;

(b) a hollow bobbin formed of insulating material and having a pair of axially spaced end flanges extending therefrom;

(c) a coil of electrically conductive material received over said bobbin intermediate said flanges with the ends of said coil terminating adjacent one of said flanges;

(d) a pair of spaced electrical terminals attached to said one flange and extending therefrom in a direction generally transverse to the axis of said coil with the ends of said coil connected to said terminals, said bobbin being received in said housing bore with said electrical terminals engaging said certain surfaces so as to locate and register said bobbin and electrical terminals and prevent relative rotation of said bobbin in said housing;

(e) a cover plate formed of insulating material received over said cover portion of said housing, said one bobbin end flange and said terminals with the periphery thereof generally conforming to the periphery of said housing cover portion, said cover plate having an aperture therein for permitting access to the hollow of said bobbin, wherein said housing, bobbin and cover plate are formed of material capable of sustained operation at temperatures of at least 155° C. without degradation of the insulating properties thereof;

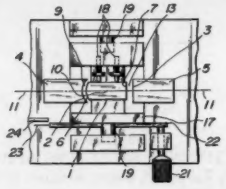
(f) a pole frame formed of ferromagnetic material, said frame being received over said housing and cover plate and having a pair of opposite sides thereof spaced so as to retain said cover plate on said housing, with one of said sides having an aperture formed therein for permitting access to the hollow of said bobbin, said pole frame surrounding said housing so as to provide a continuous magnetic flux loop about said coil; and

(g) an armature formed of ferromagnetic material slidably received through said side face aperture and extending into the hollow of said bobbin.

4,186,364
METHOD OF MAGNETIZING ERASING HEAD

Naohiro Hanaoka, Tama, Japan, assignor to Olympus Optical Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 739,865, Nov. 9, 1976, abandoned, which is a continuation of Ser. No. 559,653, Mar. 18, 1975, abandoned. This application Jun. 8, 1978, Ser. No. 913,909
Int. Cl.² H01F 13/00
U.S. Cl. 335—284 4 Claims



1. A method of magnetizing with opposed electromagnetic poles an erasing head for small type tape recorders including at least one convex surface which makes contact with a magnetic tape, comprising

making that end surface of opposed electromagnetic poles which is opposed to a convex surface of an erasing head concave, said concave surface corresponding to said convex surface of said erasing head, such that a tangential direction of a tape travelling movement is perpendicular to a direction of magnetic flux of said erasing head;

precisely making a thickness of air gap formed between said concave surface of said electromagnetic pole and said convex surface of said erasing head constant with the aid of a jig;

magnetizing said erasing head such that a widthwise direction of said tape is perpendicular to said magnetic flux direction;

testing said erasing head so as to detect a deviation angle of the direction of magnetization from a reference direction with the aid of a tester;

correcting said direction of magnetization so as to make said deviation angle zero with the aid of said jig; and

finally magnetizing a lot of erasing magnets with the aid of said jig.

4,186,365
TRANSLUCENT HOUSING FOR A CIRCUIT INTERRUPTING DEVICE

Harold H. Fahnoe, Evanston, Ill., assignor to S&C Electric Company, Chicago, Ill.

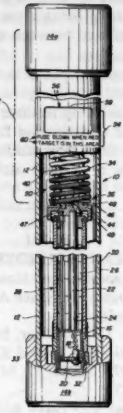
Filed Sep. 27, 1977, Ser. No. 837,235
Int. Cl.² H01H 85/30
U.S. Cl. 337—206 27 Claims

1. An improved circuit interrupting device of the type including a hollow insulative housing with a movable component within the housing which is in a first position or a second position as a function of the condition of the device, wherein the improvement comprises:

the housing being so translucent that, although the interior of the housing, including the component in one or both of its positions, is vaguely discernible from the exterior thereof, neither the position of the component nor, accordingly, the condition of the device, are accurately, visually determinable through the housing from the exterior thereof; and

a member having a first location or a second location as a function of the position of the component, the member being so configured and colored that an image thereof in the second location is readily visible through the translu-

cent housing from the exterior thereof, the presence or absence of the member image at the second location indicating the presence or absence of the component at the second position.

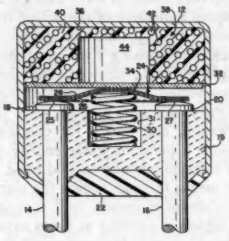


4,186,366

RADIAL LEAD THERMAL CUT-OFF DEVICE

John K. McVey, Bensenville, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Oct. 20, 1978, Ser. No. 953,305
Int. Cl.[2] H01H *37/76*
U.S. Cl. 337—407 **4 Claims**



1. A thermal cut-off device comprising a housing, a pair of radial leads each having a thermal head which extends into said housing, a relatively thin spring contact which has its outer ends in contact with the thermal ends of the leads and a center portion, a coiled bias spring engaging said center portion of said spring contact to bias it away from said leads, a force-applying member in contact with said center portion of said spring contact and a temperature-sensing pellet comprising a temperature sensing material which melts at a predetermined temperature to be sensed, said pellet being positioned between said housing and said force-applying member, said pellet having a shape such that all of the space between said force-applying member and said housing is not occupied by said pellet, so that when said temperature-sensing material melts, said bias means will force said spring contact away from said heads of said leads thereby breaking the electrical connection therebetween.

4,186,367

THICK FILM VARISTOR AND METHOD OF PRODUCING SAME

Naresh Chakrabarty, Germering; Richard Einzinger, Dietramszell, and Artur Weitze, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 22, 1978, Ser. No. 917,857
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1977, 2735484
Int. Cl.[2] H01C *7/10*
U.S. Cl. 338—21 **9 Claims**

1. In a method of producing thick-film varistors having zinc oxide as the main component thereof, the improvement comprising:

forming a glass-free varistor paste by admixing varistor materials with an organic binding agent, said paste comprising, on a 100% by weight solid material basis, about 87.5% to 98.0% by weight of ZnO, about 1.0% to 7.0% by weight of Bi_2O_3, about 0.2% to 3.5% by weight Co_2O_3 and about 0.1% to 1.0% by weight of MnO_2;

applying a substantially uniform relatively thick layer of said varistor paste onto a surface of an insulating substrate; and

sintering at least such paste layer at a temperature in the range of about 1100° C. to 1360° C. for a period of time sufficient to convert said paste layer into a thick film varistor.

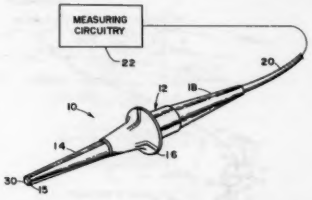
7. A glass-free thick film varistor consisting essentially of a thick film comprised of a substantially homogeneous glass-free mixture containing, on a 100% by weight solid material, basis about 87.5 to 98.0% by weight of Zn, about 1.0 to 7.0% of Bi_2O_3, about 0.2 to 3.5% by weight of Co_2O_3, about 0.1 to 1.0% by weight of MnO_2 and a material selected from the group consisting of Sb_2O_3, Cr_2O_3, SnO_2, TiO_2 and mixtures thereof in an amount sufficient to make a 100% by weight solid material within said thick film, and a pair of electrodes attached to said thick film, said varistor being characterized by a steepness value of at least above 20.

4,186,368

WIDE RANGE, QUICK RESPONSE TEMPERATURE PROBE SENSOR

Peter M. White, and David L. Timmins, both of Portland, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed May 30, 1978, Ser. No. 910,177
Int. Cl.[2] H01C *7/04*
U.S. Cl. 338—28 **5 Claims**



1. A sensor assembly for use in an electrical temperature measuring system that includes a probe, comprising:

heat conducting dielectric support and contact means including a first surface for supporting a temperature-sensing element and a second, curved surface for contacting a surface of an object being measured,

a temperature sensitive resistor disposed on said first surface in heat conducting relation therewith,

heat insulating dielectric means mounting said contact and support means in said probe with said second surface exposed,

first electrical conductor means mounted in spaced, adjacent relation to said resistor, and

second electrical conductor means connecting said resistor

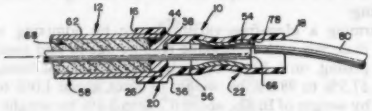
to said first conductor means, said second conductor means having a heat conducting capability substantially less than that of said first conductor means.

4,186,369

CONNECTOR FOR TERMINATING THE END OF A SHEATHED HEATING ELEMENT

John T. Attridge, Peru, and John Barnstead, Kokomo, both of Ind., assignors to Wylain, Inc., Dallas, Tex.

Filed Nov. 2, 1977, Ser. No. 847,917
Int. Cl.[2] H01C *1/02*
U.S. Cl. 338—274 **12 Claims**



1. A connector for terminating the end of a heating element, wherein said heating element includes a sheath and a terminal pin extending outwardly from the end of said sheath, comprising:

a connector body having a surface portion defining a cavity at an end thereof and a thrubore opening into said cavity and coaxial therewith;

said thrubore adapted to fit over said terminal pin in sliding relation thereto;

said surface portion adapted to slidingly engage a corresponding surface portion of said sheath;

a crimp sleeve located at the other end of said connector body;

an electrically conductive barrel located in said crimp sleeve; and

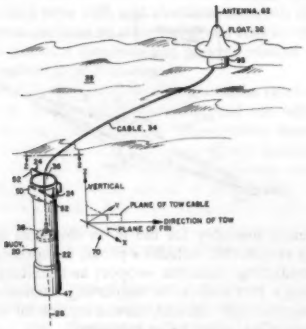
said thrubore opening into said crimp sleeve.

4,186,370

STABILIZED SONOBUOY SUSPENSION

John Cupolo, Bristol; David J. Salisbury, Barrington, and Charles W. Ouellette, Portsmouth, all of R.I., assignors to Raytheon Company, Lexington, Mass.

Filed Sep. 5, 1978, Ser. No. 939,562
Int. Cl.[2] B63B *21/52*
U.S. Cl. 367—4 **6 Claims**



1. In a sonobuoy which is dropped by aircraft for floatation at a fixed distance below the surface of the ocean, a suspension system for suspending such sonobuoy below a float at the ocean surface comprising:

a cylindrical housing enclosing a sonobuoy and including a void chamber in the upper portion of the housing, the weight of the housing and the weight of the sonobuoy being selected for providing a center of gravity and a center of buoyancy at a location adjacent the bottom of said chamber;

a pivot affixed to said housing in said chamber above said location, said housing being open at its upper end;

a suspension cable affixed between said pivot and said float; and

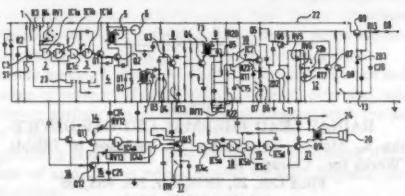
a pair of opposed parallel plates in the form of fins spaced apart and mounted exteriorly to the upper end of said housing, said plates being flexible to permit the rolling of said plates around said housing for stowage prior to deployment of said float from said chamber whereby said transducer retains a vertical attitude independently of wave motion.

4,186,371

ECHO SOUNDERS

Walter M. Toubkin, London, and Alan J. Mulley, Stevenage, both of England, assignors to Space Age Electronics Limited, London, United Kingdom

Filed Dec. 15, 1977, Ser. No. 860,897
Claims priority, application United Kingdom, Dec. 17, 1976, 52743/76; Mar. 15, 1977, 10818/77; May 27, 1977, 22547/77; Sep. 12, 1977, 37971/77
Int. Cl.[2] G01S *9/68*
U.S. Cl. 367—109 **7 Claims**



1. An echo sounder comprising transducer means for transmitting and receiving pulses of sonar energy, display means for providing a display indicative of the period between the transmission of a pulse of energy and the receipt of an echo pulse, said display means comprising a rotary member carrying first and second light emitting devices, said first light emitting device being connected to the transducer means, a motor for rotating the rotary member, a scale with which the rotary member co-operates, and means for causing the transducer means to transmit a pulse of sonar energy when the rotary member passes a datum position on said scale, an alarm device, and suppressor means through which the alarm device is connected to the transducer means, said suppressor means suppressing echo signals occurring at times other than after the end of a first variable period beginning with the transmission of a pulse of energy and before the end of a second variable period beginning with the transmission of a pulse of energy, said second light emitting device being energised from the end of said first variable period to the end of the second variable period.

4,186,372

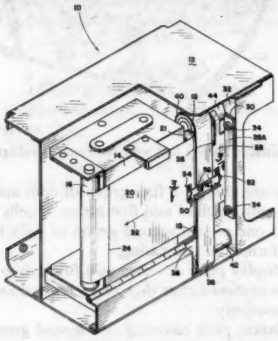
BRUSH HOLDER FOR RECTILINEAR RECORDER

Rex M. Maloy, Broken Arrow, Okla., assignor to Lowrance Electronics, Inc., Tulsa, Okla.

Filed Sep. 25, 1978, Ser. No. 945,486
Int. Cl.[2] G01S *7/60*; G01D *15/06*
U.S. Cl. 367—115 **4 Claims**

1. In a rectilinear sonar depth recorder having means responsive to a recording means to initiate an outgoing sonar signal and means to generate an electrical pulse to record on a web of recording material, a mark at the time of reception of the return sonar signal, said recorder comprising;

(a) a web of recording material supported by a roll and a parallel spaced roller, so as to move longitudinally in contact with and across a plane metal back-up plate;
(b) a belt means supported by a pair of spaced rollers and means to move said belt in a direction transverse to the longitudinal motion of said web; one linear portion of the loop of said belt parallel to and spaced a selected distance from said plane metal surface;
(c) electrical contact plate means positioned adjacent to, and parallel to, said linear portion of said loop of said belt;
(d) a first means attached to said belt, adapted to cooperate with said means to initiate said outgoing sonar signal, to initiate said signal; and
(e) contact assembly means attached to said belt at a selected point relative to said first means;
the improvement in said contact assembly means, comprising;
(f) contact holder means comprising a plate of thin metal attached to said belt, said plate transverse to the length of said belt and long enough to extend over both edges of said belt,



and including a first and second slot in two trailing edges or forks of said plate, one fork and slot near each end of said plate;
(g) contact means supported on said contact holder means comprising metal wire formed so that the two ends of said wire are spaced apart at a selected distance and are adapted to press respectively, one end on said electrical contact plate means, and the other end on said web;
whereby as said belt, said contact holder means, and said contact means moves transverse to said web when said electrical pulse appears on said electrical contact plate means, it is carried to said web by said contact means to provide a mark on said web; and wherein
(h) said metal wire contact means includes a central portion removably attachable to said metal plate in a generally transverse direction to said belt and having two end portions which are bent to extend backwardly in planes generally parallel to said belt, and to slide in and be guided transversely by said slots, respectively, and to press respectively on said electrical contact plate means and said paper.

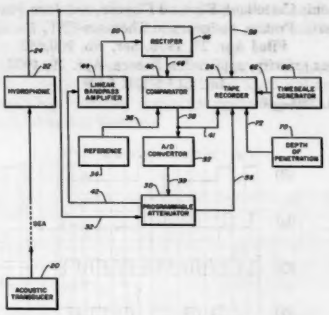
4,186,373

SYSTEM FOR MEASURING IN SITU ACOUSTIC ENERGY PROPERTIES OF OCEAN FLOOR SOILS

John R. Thompson, Camarillo, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 22, 1978, Ser. No. 908,487
Int. Cl.[2] G01N *3/30*; G01V *1/38*
U.S. Cl. 367—131 **14 Claims**

1. A method of determining the acoustic energy properties of sea floor soils comprising the steps of:
a. providing a body of known size, weight and shape capable of transmitting acoustical signals;
b. releasing said body into the sea such that said body descends in free fall until it strikes and penetrates the sea floor coming to rest therein;
c. receiving said transmitted acoustic signals with a receiver disposed near the sea surface; and



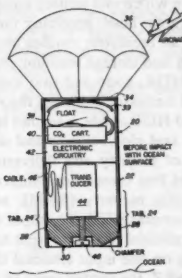
d. generating an analog signal from the received acoustic signals, said generated signal being a function of the acoustical attenuation of the transmitted acoustic signal from a time immediately preceeding said body's striking the sea floor surface until said body comes to rest in the sea floor.

4,186,374

TRANSDUCER HOUSING WITH RELEASE MECHANISM

Charles W. Ouellette, Portsmouth, R.I., assignor to Raytheon Company, Lexington, Mass.

Filed Jan. 3, 1978, Ser. No. 866,889
Int. Cl.[2] H04B *13/00*
U.S. Cl. 367—7 **4 Claims**



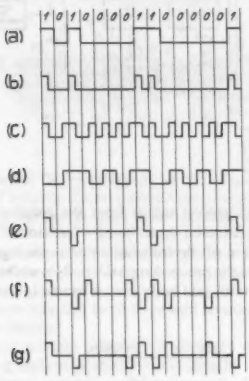
1. A release mechanism for a sonar transducer housing comprising:
said housing having longitudinal slots at an end of said housing, a pair of said slots defining a tab which is bendable, said housing having a plurality of said tabs, each of said tabs having an opening therein; and
a cover having pins for engaging said openings, said cover having a chamfer located inwardly of a wall of said housing and being inclined relative to a longitudinal axis of said housing for directing the force of a water impact against said tabs to bend said (tap) tabs away from said cover to separate said tabs from said pins, thereby releasing said cover and said transducer from said housing.

4,186,375

MAGNETIC STORAGE SYSTEMS FOR CODED NUMERICAL DATA WITH REVERSIBLE TRANSCODING INTO HIGH DENSITY BIPOLAR CODE OF ORDER N

Jean-Louis Castellani; Edmond Flayosc, and Jean Pasternak, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 27, 1978, Ser. No. 900,663
Claims priority, application France, Apr. 29, 1977, 77 12953
Int. Cl.[2] G11B 5/09
U.S. Cl. 360—40 5 Claims



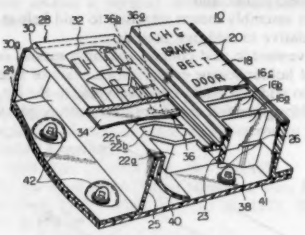
1. A magnetic storage system for numerical data coded in the high density code of order n (HDB_n) comprising: recording means having an input receiving binary data in the "non return to zero" (NRZ) code and synchronization clock signals, said recording means including a first transcoder transforming said input (NRZ) data into ternary code (HDB_n) data, a magnetic head to which said ternary coded signal is applied, a storage medium on which said ternary coded signal is recorded through said magnetic head, receiving further premagnetization signals from an oscillator, reading means having a magnetic head reading said storage medium; means for recovering said data in the HDB_n-code and said synchronization clock signals and circuit means for detecting the violation of alternating polarity in said HDB_n-code, a second transcoder receiving said HDB_n-code, said clock signals and said signal acknowledging violation of polarity and delivering the data in the original NRZ, said first transcoder comprising a buffer memory and a read only memory (ROM), said buffer memory having two input terminals and one output terminal, said ROM having one input terminal and two output terminals, said buffer memory receiving on one input terminal through a first gate, the signal coded NRZ, the second input of said buffer memory being connected through a second gate to the first output terminal of said ROM, the output of said buffer memory being connected through a third gate to the first input terminal of said ROM, the three gates being controlled by said clock signals, said buffer memory storing n+3 digits: B_0, B_1, B_2 . . . B_{n+2} with the least signification digit B_0 being supplied by the NRZ signal, the remaining digits B_1, B_2 . . . B_{n+2} being supplied by said ROM; said buffer memory receiving the n+3 digits in the first half cycle of said clock signal, said second output terminal of the ROM supplying two digits, means delivering the signal coded HDB_n upon application of said two digits, said ROM receiving in the second half cycle of said clock signal, said n+3 digits from said buffer memory for addressing said ROM.

4,186,376

ILLUMINABLE SAFETY AND VEHICLE FUNCTION DISPLAY DEVICE

Hisao Uchida, Omiya, Japan, assignor to Nissan Motor Company, Limited, Yokohama and Kanto Seiki Company, Limited, Omiya, both of, Japan

Filed Jul. 31, 1978, Ser. No. 929,234
Claims priority, application Japan, Aug. 8, 1977, 52-106007[U]
Int. Cl.[2] G08B 19/00; B60Q 9/00
U.S. Cl. 340—52 F 8 Claims



1. An illuminable safety and vehicle function display device, comprising:

a casing having therein a first group of cells and a second group of cells, each of said first group of cells being connected to one of said second group of cells through an opening formed in said casing;

a labelled display plate covering said first group of cells to allow the caution letters thereon to be positioned on the cells respectively;

a figured display plate covering said second group of cells;

a light shielding plate disposed between said figured display plate and said second group of cells, said shielding plate being formed therein with a plurality of translucent portions each of which is located at a given part of said figured display plate and is arranged on one of said second group of cells; and

a single light source disposed in a portion which is open to said opening formed in the casing, whereby a given caution letter of said labelled display plate and also the corresponding translucent portion of said shielding plate are illuminated when said light source is energized to light up.

4,186,377

METHOD AND APPARATUS FOR MONITORING TIRE PRESSURE

William A. Barabino, North Reading, Mass., assignor to Safety Research & Engineering Corporation, North Reading, Mass.

Continuation-in-part of Ser. No. 665,889, Mar. 11, 1976, abandoned. This application Dec. 8, 1977, Ser. No. 858,842
Int. Cl.[2] B60C 23/02; G08B 21/00
U.S. Cl. 340—58 6 Claims

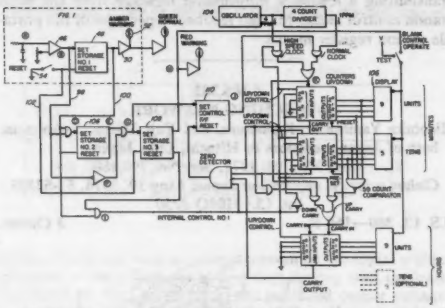
1. A system for monitoring the pressure of a pneumatic tire and determining the rate of loss of such pressure in the event of a leak, comprising

(a) signal generating means operatively associated with said tire and adapted to produce a signal at each of at least two different, time-spaced low pressure levels,

(b) transducer means spaced from said tire and adapted to detect said signals and generate electrical signals therefrom,

(c) electrical processing means connected to said transducer means and adapted to measure the time lapse between

signals and calculate therefrom the time remaining for said pressure to reach a critical level, and,



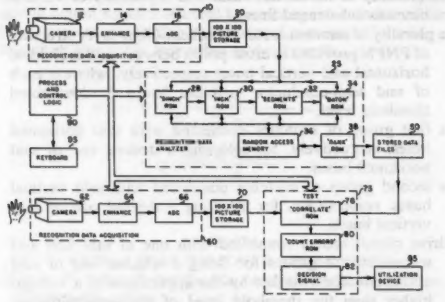
(d) display means connected to said processing means and adapted to display said remaining time in visual form.

4,186,378

IDENTIFICATION SYSTEM

Clifford H. Moulton, Portland, Oreg., assignor to Palmguard Inc., Beaverton, Oreg.

Filed Jul. 21, 1977, Ser. No. 817,623
Int. Cl.[2] G06K *9/12*
U.S. Cl. 340—146.3 E **12 Claims**



1. A method of providing identification of a person by the characteristics of his palm, comprising the steps of:

scanning by opto-electronic means the palm of said person and producing an analog signal proportional to levels of light of said palm;

converting said analog signal to digital picture data representative of a substantially complete picture of said palm;

storing said digital picture data in a picture storage device;

electronically analyzing said picture data and selecting therefrom recognition data corresponding to prominent characteristics of said recognition pattern, said recognition data including point location, line quality, and line direction of pattern lines of said palm; and

storing said recognition data to provide said identification.

4,186,379

HIGH-SPEED DATA TRANSFER APPARATUS

Daryl E. Knoblock, Dunnyvale, and Kenneth O. Carey, San Jose, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 28, 1977, Ser. No. 791,804
Int. Cl.[2] G06F *11/00*; H04Q *3/00*
U.S. Cl. 340—146.1 R **27 Claims**

1. High-speed data transfer apparatus comprising:

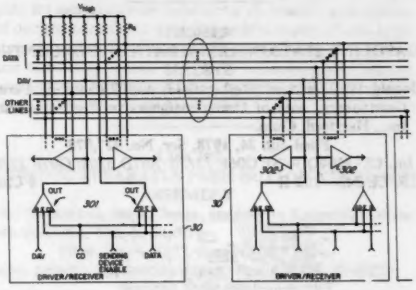
two or more data driver means for driving data signals having high and low logic voltages to be transferred, each of said data driver means being selectively enabled for driving high and low logic voltages;

one or more data receiver means for operating on the data signals in response to a logic signal representing the validity of the data signals being driven by data driver means;

data bus means for coupling data signals commonly from an enabled data driver means to one or more of the data receiver means;

one or more logic driver means for driving the logic signals, said logic signals having high and low logic voltages;

one or more logic receiver means for operating on the logic signals in response thereto;



logic bus means for coupling the logic signals commonly from a logic driver means to one or more logic receiver means;

control means coupled to each of the data driver and logic driver means for producing a control signal in response to the data signals and for terminating the control signal in response to the logic signal; and

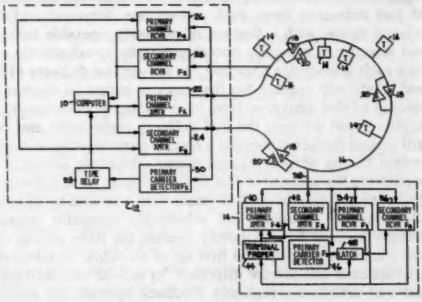
each of the enabled data driver means being controlled by its control signal for driving only high or low logic voltage, all of said controlled data driver means being controlled to drive the same logic voltage.

4,186,380

MULTI-TERMINAL COMPUTER SYSTEM WITH DUAL COMMUNICATION CHANNELS

Allan I. Edwin, and Melvin T. Bennett, both of Ann Arbor, Mich., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 21, 1977, Ser. No. 844,339
Int. Cl.[2] H04Q *5/00*
U.S. Cl. 340—147 SC **16 Claims**



1. A communication system for connecting a computer to a plurality of separated, remotely spaced terminals, comprising:

a continuous segment of bi-directional communication channel connected to each of the terminals; a primary transmitter having its output connected to a first end of the communication

channel; a secondary transmitter having its output connected to the second end of the communication channel output connections from the computer to each of the transmitters; a detector for the primary transmitter signal connected to the end of the communication channel adjacent to the secondary transmitter; and switch means controlled by the output of the primary transmitter signal detector for energizing the secondary transmitter when the detector fails to receive the primary transmitter signal, whereby, in the event of failure of the primary transmitter or interruption within the communication channel, the secondary transmitter will provide the computer output to those terminals unable to receive the primary transmitter signal.

4,186,381

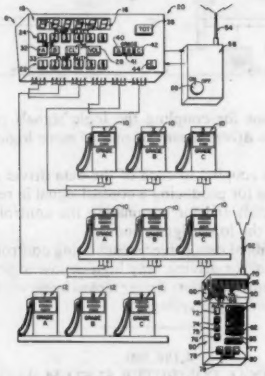
GASOLINE STATION REGISTRATION AND CONTROL SYSTEM

Donald W. Fleischer, Wethersfield, and Richard E. Peruggi, Glastonbury, both of Conn., assignors to Veeder Industries Inc., Hartford, Conn.

Filed Jul. 24, 1978, Ser. No. 927,578

Int. Cl.[2] H04Q *9/00;* **G06F** *15/56;* **B67D** *5/08;* **G07F** *13/00*

U.S. Cl. 340—152 R **8 Claims**



1. In a hybrid fuel delivery system having a plurality of separate self-service and attendant operated fuel delivery dispensers for self-service and attendant operated delivereies of fuel respectively and a fuel delivery registration and control system having a first fixed station control system electrically connected to each self-service dispenser and comprising first register means selectively operable for registering the amount of fuel delivered from each self-service dispenser and first control means with a first set of manually operable switches and selectively manually operable thereby to selectively activate each self-service dispenser for self-service delivery of fuel and selectively operate the first register means to register the amount of fuel delivered from each self-service dispenser, the improvement wherein the fuel delivery registration and control system further comprises a second portable station control system having second register means selectively operable for registering the amount of fuel delivered from each self-service dispenser and second control means with a second set of manually operable switches and selectively manually operable thereby to selectively remotely operate the fixed station control means, in place of said first set of switches, to selectively activate each self-service dispenser for self-service delivery of fuel and selectively remotely feedback operate the portable station register means via the portable station control means to register the amount of fuel delivered from each self-service dispenser, and wherein the fixed station control means and portable station control means have respective compatible wireless transceiver interface means for transmitting a control message from the portable station control means in accordance with said manual operation of said second set of switches for said remote operation of the fixed station control means and for transmitting a feedback information message from the fixed station control means for said feedback operation of the portable station register means.

4,186,382

SWITCHING NETWORK

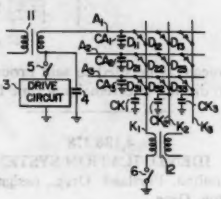
Hidetaka Yamashita, Kamakura, and Yuji Miura, Yokohama, both of Japan, assignors to Hitachi, Ltd., Japan

Filed May 10, 1977, Ser. No. 795,450

Claims priority, application Japan, May 10, 1976, 51-52205

Int. Cl.[2] H04Q *3/50*

U.S. Cl. 340—166 R **3 Claims**



1. A switching network comprising:

A plurality of horizontal buses and a plurality of vertical buses as unbalanced lines;

a plurality of semiconductor switches of four-layer structure of PNPN provided as cross-points between said individual horizontal and vertical buses respectively, wherein each of said semi-conductor switches has a predetermined threshold level;

a first group of switches connected with said horizontal buses, respectively, for selecting a desired one of said horizontal buses;

a second group of switches connected with said vertical buses, respectively, for selecting a desired one of said vertical buses;

drive circuit means connected with one of said first and second switch groups for firing a selected one of said semiconductor switches by the application of a voltage higher than the threshold level of the semiconductor switch through the switch group and supplying a holding current flow therethrough; and

capacitors continuously connected between the ground and said individual horizontal and vertical buses respectively, to prevent noise from either grounded or non-grounded sources from flowing in any of the semiconductor switches, thereby preventing erroneous firing of the semiconductor switches resulting from a rate effect due to the noise.

4,186,383

CHARGE WEIGHTING DIGITAL-TO-ANALOG CONVERTER

Bernd Höfflinger, No. 23, Gartenstrasse, 5841 Holzen, and Jürgen Dahms, No. 30, Hirschweg, 4600 Dortmund-Berghofen, both of Fed. Rep. of Germany

Filed Mar. 1, 1977, Ser. No. 773,255

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1976, 2612204

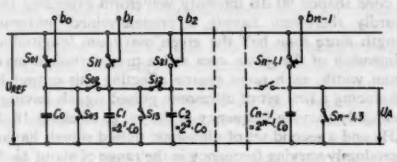
Int. Cl.[2] H03K *13/02*

U.S. Cl. 340—347 DA **5 Claims**

1. A digital-to-analog converter consisting of capacitors for a weighted charge distribution corresponding to the digits of an n-digit binary number that is to be converted, comprising n weighted capacitors ($C_0, C_1, \ldots, C_{n-1}$) connected in parallel coupled with charging switches ($S_{01}, \ldots, S_{n-1,1}$) connected in parallel for the n digits ($b_0, b_1, \ldots, b_{n-1}$) of a binary number,

discharging switches ($S_{03}, \ldots, S_{n-1,3}$) and charge distributing switches ($S_{02}, \ldots, S_{n-1,2}$) as well as a reference voltage source (U_{REF}) being also provided;

wherein said n bits of the digital number are divided into m



groups (bytes) and each m group is converted in parallel within group but serially from group to group starting with the least significant bit first, and wherein the weighted output voltage U_{AGN} by the Nth group is calculated from the unweighted voltage U_{AN} by reference to the formula

$$U_{AGN} = \frac{U_{AN}}{\frac{n(m-N)}{2^m}}$$

(n=number of bits per byte, m=number of groups, N=group number), and wherein the overall output voltage representing the analog of the converted binary number is obtained by charge equalization, and wherein the capacitive division of the analog output signal is effected by opening the switches of the converter and connecting an additional capacitor C_p having a capacity $(2P-1)\,C_0$, according to the formula

$$U_A = U_A \frac{C_O}{(2^p - 1)C_O + C_O} = \frac{U_A}{2^p}$$

$$\left(p = \frac{n(m-N)}{m}\right).$$

4,186,384

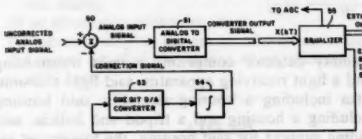
SIGNAL BIAS REMOVER APPARATUS

William F. Acker, Seminole, Fla., assignor to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 705,985, Jul. 16, 1976, abandoned, which is a division of Ser. No. 589,954, Jun. 24, 1975, Pat. No. 3,992,616. This application Aug. 17, 1977, Ser. No. 825,336

Int. Cl.² H03K *13/02*

U.S. Cl. 340—347 AD **1 Claim**



1. An equalizer input bias signal removal system for adjusting an analog input signal toward being symmetrical about a reference signal level where said analog input signal, combined with a correction signal, is to be converted by an analog-to-digital converter into a converter output signal in form of a digitized discrete time signal provided as a sequence of data samples each formed as a digital word comprising magnitude bits in a first sign bit, said bias signal removal system comprising:

a transversal filter equalizer having an input and an output, said transversal filter equalizer being capable of receiving said converter output signal at an input thereof and being capable of providing an error sign bit signal at an output thereof, said error sign bit signal representing a sign of a difference between said transversal filter equalizer output and an allowed transmitted signal level;

a sign detection means having an input and an output, said sign detection means input being electrically connected to said transversal filter equalizer output to receive said error sign bit signal, said sign detection means providing a second sign bit signal comprising a sequence of second bits formed as one-bit digital words derived from said error sign bit signal at said sign detection means output;

a one-bit digital-to-analog converter means to receive said second sign bit signal and being capable of providing said correction signal in form of an analog signal having a polarity and amplitude depending on relative proportions of occurrence of said second sign bits in one of two logic states in a time duration recently passed; and

a first combining means capable of combining said correction signal with said analog input signal and of providing this combination to said converter.

4,186,385

ELECTRONIC APPARATUS PUSH BUTTON KEYBOARD ASSEMBLY

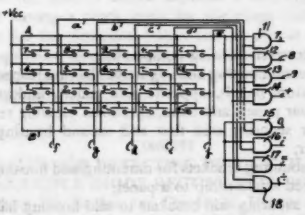
Shinichi Nagashima, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Jun. 6, 1977, Ser. No. 804,040

Claims priority, application Japan, Jun. 4, 1976, 51-65322

Int. Cl.² 606F *3/02*

U.S. Cl. 340—365 S **4 Claims**



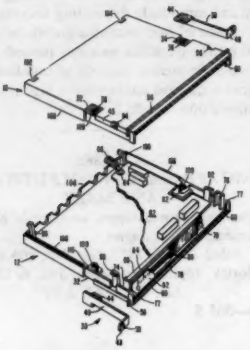
1. A keyboard input assembly comprising a plurality of manually operated push button switches divided into first and second groups, each of said switches having a first and second fixed contact and a movable member for contacting both said first and second contacts when said button switch is operated and for remaining out of contact with said first and second contacts when said switch is not operated, a plurality of logic means, each said logic means corresponding to one of said manually operated switches, and each said logic means having at least a first input means and a second input means and each said logic means being adapted to produce a predetermined signal in response to said first and second inputs of said logic means being coincidentally energized, said logic means being divided into first and second groups, a first input of each of said logic means in said first group being coupled to all of said plurality of said first fixed contacts in said first group of manually operated switches, each said first input of said logic means in said second group being coupled to all of said first fixed contacts in said second group of manually operated push button switches, a second input of each logic means in said first group of logic means being coupled to the second input of an individual logic means in said second group of logic means, and being further coupled to the second fixed contact of one manually operated push button switch in said first group and one manually operated push button switch in said second group of manually operated push button switches, so that each of said first and second inputs of said logic means are coincidentally energized by a fixed power supply in response to said manually operated push button switch corresponding thereto

being actuated, the movable member of each of said push button switches being continuously coupled to said power supply.

4,186,386
INSTRUMENT HOUSING

John W. Forrest, West Acton, Mass., assignor to Bowmari Ali, Inc., Acton, Mass.

Filed Jan. 10, 1978, Ser. No. 868,417
Int. Cl.[2] H02B *1/08*; G08B *5/00*
U.S. Cl. 340—366 R **13 Claims**

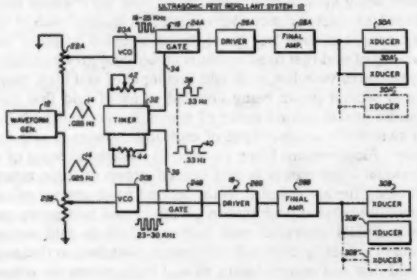


1. An instrument housing comprising:
first and second mating housing halves having respective top and bottom panels, opposite side panels, multiple apertured rear panels and front, apertured viewing regions;
means for securing said first and second housing halves together;
a pair of mounting brackets for mounting said housing halves in secured relationship to a panel;
means for securing said brackets to said housing halves;
the opposing sides of said housing halves being channeled to receive said brackets along a substantial length of the sides thereof to provide rigid placement of said bracket.

4,186,387
ULTRASONIC PEST REPELLENT METHOD AND SYSTEM

Robert G. Moschgat, North Stonington, Conn., assignor to Micro-Sonics, Inc., Scarsdale, N.Y.

Continuation-in-part of Ser. No. 738,807, Nov. 4, 1976, abandoned. This application Oct. 11, 1977, Ser. No. 840,061
Int. Cl.[2] G08B *3/10*
U.S. Cl. 340—384 E **8 Claims**

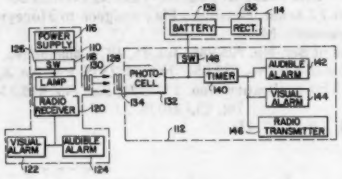


1. A method of sonifying a portion of a given area having a given maximum longitudinal dimension and a lateral dimension to rid the area of unwanted pests comprising:
a. providing a plurality of ultrasonic point sources each producing a set of pulsed signals having a randomly varying frequency in the range of about 18–30 KHz and having a cone shaped 90 dB intensity waveform extending outwardly therefrom having a predetermined maximum length more than half the given maximum longitudinal dimension of the given area and a predetermined maximum width, each point source effecting this output by producing a first set of ultrasonic pulsed signals having a randomly varying frequency in the range of about 18–25 KHz and a second set of ultrasonic pulsed signals having a randomly varying frequency in the range of about 23–30 KHz and alternately enabling said first and second signals by providing first and second signal channels generating a randomly varying frequency signal in each channel corresponding in frequency to said first and second signals, gating the two channels to alternately enable one and then the other and providing a set of first and second transducers for each point source and applying the signals from the first and second channels to the first and second transducers, respectively, of all the point sources; and
b. sonifying the given area to an intensity level of not less than 90 dB by disposing at least two groups of two longitudinally opposing sets of transducers along the lateral dimension of the area to effect overlapping of the cone shaped waveforms at the ends thereof with adjacent sets of transducers having the distance therebetween less than the maximum width to effect an overlapping of adjacent cones and disposing at least two sets of transducers along the longitudinal dimension to provide a waveform perpendicular to that of the adjacent sets of transducers along the lateral dimension to sonify any dead space therebetween.

4,186,388
PROXIMITY DETECTOR

Donald W. Robinson, 3011 W. 130th Ave., Crown Point, Ind. 46307

Filed Nov. 18, 1977, Ser. No. 852,830
Int. Cl.[2] A63K *1/00*; G01T *1/16*; G08B *23/00*
U.S. Cl. 340—556 **9 Claims**



1. A proximity detector comprising a light transmitting apparatus and a light receiving apparatus, said light transmitting apparatus including a housing assembly, said housing assembly including a housing and a tripod and indicia, said tripod providing support for said housing, the lowermost regions of said tripod having lockable wheels rotatably secured thereto disposed upon a supporting surface, said housing being elevated relative to the uppermost regions of said tripod, said tripod being adjustable in height, means to rotatably secure said housing with respect to said tripod about a first axis including means to releasably lock said housing against rotation about said first axis, means to rotatably secure said housing with respect to a second axis including means to releasably lock said housing against rotation about said second axis, said second axis disposed orthogonal to said first axis, said indicia indicating the elevation of said housing relative to said uppermost regions, said light transmission apparatus including a light source and a radio receiver and a first power supply and an alarm group of devices, said alarm group including a visual

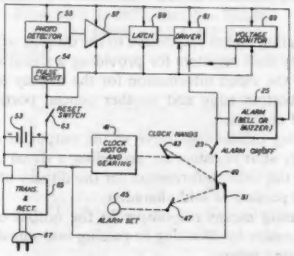
alarm and an audible alarm, said first power supply coupled to said light source and said radio receiver and said alarm group, said radio receiver energizing said alarm group from said first power supply only when said radio receiver is activated by radio signals, said light receiving apparatus having another said housing assembly and a photosensitive device and a timer and another said alarm group and a radio transmitter and a second power supply, means for said radio signals being transmitted by said radio transmitter to be received by said radio receiver, said second power supply coupled to and providing energizing power said photosensitive device and said timer and said another alarm group and said radio transmitter, said timer controlling the time of energization of said another said alarm group and the time that said radio transmitter transmits said radio signals to said radio receiver, said another said alarm group and said radio transmitter and said timer being energized by said second power supply only when said photosensitive device ceases to receive light emanated by said light source.

4,186,389

SLEEPER'S SMOKE-ALARM CLOCK

Clifford G. Flittie, 33 Stonehouse Rd., Scarsdale, N.Y. 10583

Filed Feb. 9, 1978, Ser. No. 876,332
Int. Cl.[2] G04B *47/00*; G08B *17/10*
U.S. Cl. 340—628 **10 Claims**



1. An alarm device capable of providing both a time alarm and a fire alarm comprising:
(a) a timepiece providing an output representing time of day;
(b) means for setting an alarm time and providing an output representative thereof;
(c) means to compare said time of day output with said alarm time output and to provide an output when the two coincide;
(d) an electrically operated alarm;
(e) a switch coupling the output of said means to compare to said alarm;
(f) an electronic smoke detector;
(g) means to amplify the output of said smoke detector; and
(h) means coupling the output of said means to amplify to said alarm.

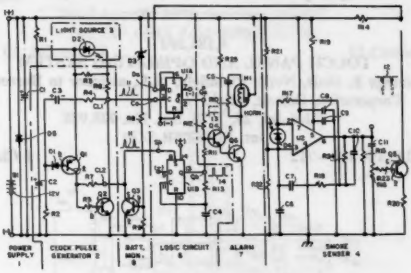
4,186,390

BATTERY POWERED SMOKE DETECTOR

Robert B. Enemark, Duxbury, Mass., assignor to Electro Signal Lab, Inc., Rockland, Mass.

Continuation of Ser. No. 718,686, Aug. 30, 1976, abandoned. This application Jan. 26, 1978, Ser. No. 872,674
Int. Cl.[2] G08B *17/10*
U.S. Cl. 340—630 **15 Claims**

1. An electrical circuit for an optical detector of smoke or other fluid borne light scattering matter comprising:
a source of pulsed light directed on a smoke sensing path,
photoelectric means responsive to pulsed light to generate electrical detection pulses,
clock means periodically producing electrical clock pulses energizing the light source, and
a control circuit coupled to the clock means and photoelectric means receiving clock pulses and detection pulses respectively therefrom,
wherein the photoelectric means responds to increasing scatter of light from the source by matter increasing beyond a predetermined density to generate detection pulses of predetermined amplitude range,
wherein the control means includes means responsive to coincident receipt of said clock and detection pulses to convert detection pulses within said predetermined amplitude range into an alarm signal, the control circuit being responsive to subsequent clock pulses and a coincident detection pulse outside said predetermined amplitude range to terminate the alarm signal, and
wherein the control circuit includes a data-type flip-flop stage having a clock input for the clock pulses, a data input for the detection pulses and an output carrying a voltage level for each clock period corresponding to the amplitude range of the detection pulse at the beginning of the period.

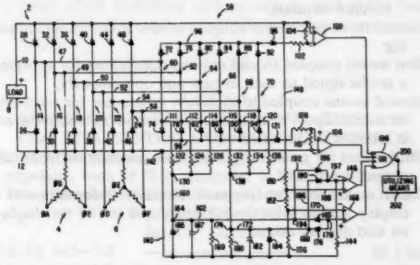


4,186,391

APPARATUS FOR DETECTING DIODE FAILURES IN MULTIPLE DIODE RECTIFIER BRIDGES

Shou-I Wang, Old Bridge, and Charles M. Hansen, Jr., Ocean City, both of N.J., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Aug. 22, 1978, Ser. No. 936,266
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—645 **9 Claims**



1. For apparatus of the type including an AC voltage source and rectifier means having an arrangement of rectifying devices for rectifying the AC voltage from the voltage source to provide a DC voltage, means for detecting failed rectifying devices in the rectifier means comprising:
detector means having an arrangement of rectifying devices corresponding to the rectifier means arrangement of rectifying devices;
the detector means connected to the AC voltage source for rectifying the AC voltage to provide a DC voltage;

means arranged with the detector means rectifying devices for providing a phantom neutral voltage; and

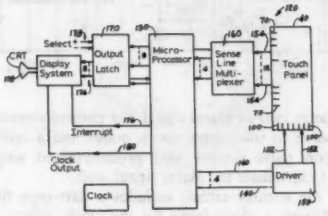
means connected to the rectifier means, the detector means and the means for providing a phantom neutral voltage, and responsive to the rectifier means DC voltage, the detector means DC voltage and the phantom neutral voltage for detecting predetermined relationships between the rectifier means DC voltage and the detector means DC voltage, and between the phantom neutral voltage and the rectifier means DC voltage, and for providing outputs indicative of said relationships.

4,186,392

TOUCH PANEL AND OPERATING SYSTEM

George E. Holz, North Plainfield, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jul. 28, 1978, Ser. No. 928,958
Int. Cl.[2] G08B 5/36
U.S. Cl. 340—712 **4 Claims**



1. A touch panel display system comprising

a display device for displaying information,

a touch panel in operative relation with said display device, said touch panel including

(1) an insulating support plate having an inner surface and an outer surface,

(2) an array of rows and columns of first conductive areas on the inner surface of said support plate, each row of said first conductive areas being connected by a row conductor to a row terminal,

(3) an array of rows and columns of second conductive areas on the outer surface of said support plate, each second area overlying a first area and being capacitively coupled thereto, each column of said second conductive areas being connected by a column conductor to a column terminal,

electronic circuit means coupled to said touch panel including

first means coupled to said column conductors for applying a strobe signal to each in turn and continuously,

second means coupled to each row conductor for receiving an output signal when one of said second conductive areas is touched by an operator,

third means for generating coordinate information from said output signal, and

fourth means for coupling said coordinate information to a display system wherein information is stored for display on said display device.

4,186,393

DIGITAL CHARACTER FONT ENHANCEMENT DEVICE

William Leventer, 18 Bruce La., East Northport, N.Y. 11731

Continuation of Ser. No. 757,069, Jan. 5, 1977, abandoned. This application Feb. 27, 1978, Ser. No. 881,852
Int. Cl.[2] G06F 3/14
U.S. Cl. 340—729 **3 Claims**

1. A digital video display enhancement device having a synchronized video signal supplied thereto comprising:

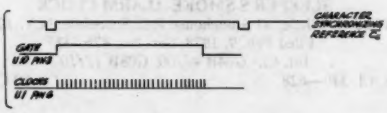
means for supplying a synchronized clock pulse signal;

interval determining means responsive to the clock pulse signal for determining a certain number of intervals on a scan line;

two scan line shift registers, each having a number of bits equal to the number of intervals on a scan line determined by said interval determining means and responsive to the output of the interval determining means and the digital video signal for providing a first output signal of the digital video signal delayed by one scan line and a second output signal delayed by two scan lines;

three small-capacity shift registers, each having a capacity which is substantially less than said scan line shift registers and being responsive to each of the scan line delayed signals and an undelayed incoming video signal for providing three sets of intermediate output signals; and

first gating means responsive to the outputs of said small-capacity shift registers for providing a signal representative of the video information for the display of the top edge, left edge and a central portion of a desired character;



second gating means responsive to the outputs of said small-capacity shift registers for providing a signal representative of the video information for the display of the right edge, bottom edge and another central portion of said desired character;

third gating means responsive to the output of said small-capacity shift registers for providing a signal representative of the video information for the display of the entire central portion of said character;

fourth gating means responsive to the output of the first gating means for blocking or passing said signal from said first gating means;

fifth gating means responsive to the outputs of the fourth gating means and said second gating means for providing a signal representative of the bulk of the entire character to be displayed; and

sixth gating means responsive to the outputs of the third and fifth gating means for providing a signal representative of video information for the display of said character.

4,186,394

AUTOMATIC DISPLAY SYSTEM AND PROCESS

Tadeusz Bobak, and Tadeusz C. Bobak, both of 540 San Vicente Blvd., Apt. 4, Santa Monica, Calif. 90405

Filed Sep. 18, 1978, Ser. No. 942,972
Int. Cl.[2] G09F 9/32
U.S. Cl. 340—764 **18 Claims**

1. A display system for automatically displaying dot matrix images, comprising:

(1) a generally flat display panel having a generally vertical front plane, a panel body and a rear side, said panel being subdivided into a plurality of display modules having a honeycomb-like structure formed by a plurality of rectangularly shaped display elements;

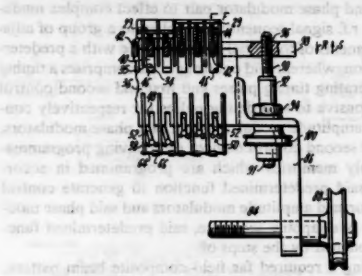
(2) a projection block having a clear front face slidably disposed in each one of said display elements between a retracted position where its front face is invisible, and an advanced position where its front face visibly coincides with said panel front plane;

(3) slider means fixed to said projection block and extending through said panel body to the rear side thereof;

(4) control means at each one of said slider means;

(5) image preforming means at the rear side of said panel, for producing a preformed image; and

(6) image resetting and setting means for resetting a displayed image and for setting and displaying said pre-



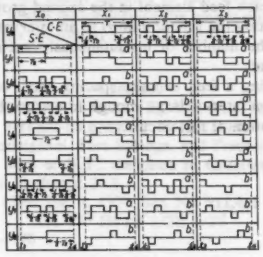
formed image transferred to said control means during the image resetting step.

4,186,395

METHOD OF DRIVING A LIQUID CRYSTAL DISPLAY APPARATUS

Masanori Fujita, Matsudo, and Hajime Oda, Sakura, both of Japan, assignors to Kabushiki Kaisha Seikosha, Japan

Filed Mar. 1, 1977, Ser. No. 773,307
Int. Cl.[2] G09F 9/32; G06F 3/14
U.S. Cl. 340—765 **3 Claims**



1. A method of applying pulse trains to a plurality of electrodes comprising selection electrodes and control electrodes which are opposed to each other through a liquid crystal, each control electrode being common to a plurality of selection electrodes and each of the selection electrodes and the opposed control electrode with the liquid crysytal interposed therebetween constituting a display unit, said method comprising the following steps:

to each of the control electrodes, applying a pulse train of which the total generation time generated during a cyclical period of time T is constant and the phase relation of pulses measured from a specified time to point is different for different control electrodes;

to the selection electrode of a display unit to be displayed, applying a pulse train having such phase relation to the pulse train applied to the opposed control electrode that the ratio of the total generation time (to) of pulses applied to the liquid crystal interposed between the selection electrode and the control electrode opposed thereto to the cyclical time period T, namely the time ratio (to)/T, is a value needed for allowing the liquid crystal to be active in order to display the display unit;

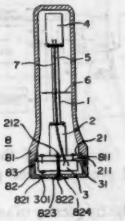
to the selection electrode of a display unit not be be displayed, applying a pulse train having such phase relation to the pulse train applied to the opposed control electrode that the ratio of the total generation time (t_1) of pulses applied to the liquid crystal interposed between the last mentioned selection electrode and the control electrode opposed thereto to the cyclical time period T, namely the time ratio, (t_1)/T, is a value below that needed for the liquid crystal to be active in order not to allow the display unit to display.

4,186,396

RADAR BEACON APPARATUS

Keigo Kotoh, and Akiyoshi Morinaka, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1978, Ser. No. 901,087
Int. Cl.[2] G01S 9/56; H01Q 21/00
U.S. Cl. 343—6.8 R **12 Claims**



3. A radar beacon apparatus comprising:

a slot receiving antenna having a rectangular cross section and including a plurality of slots formed on the relatively wide rectangular surfaces;

a receiving unit connected to one edge surface of said slot receiving antenna and adapted to receive a signal from said slot receiving antenna;

a separate transmitting unit disposed axially with respect to said slot receiving antenna and adapted to be controlled by a signal from said receiving unit;

a wire electrically connecting said receiving and transmitting units;

a slot transmitting antenna adapted to receive signals from said transmitting unit, said slot transmitting antenna having a rectangular cross section and including slots formed on the relatively wide rectangular surfaces, said slot transmitting antenna being connected at one end to said transmitting unit and further being axially disposed with respect to said slot receiving antenna; and

a radar dome enclosing said apparatus, said dome being composed of a material which is transparent to radar waves.

4,186,397

SHORT RANGE PRECISION NAVIGATION AND TRACKING SYSTEM AND METHOD THEREFOR

Wayne I. Sternberger, Peacedale, and Lester R. LeBlanc, Narragansett, both of R.I., assignors to Board of Regents for Education of the State of Rhode Island, Providence, R.I.

Filed Sep. 6, 1977, Ser. No. 830,408
Int. Cl.[2] G01S 9/04
U.S. Cl. 343—7.5 **16 Claims**

1. A method for determining the distance between a master station and a repeater station comprising the steps of:

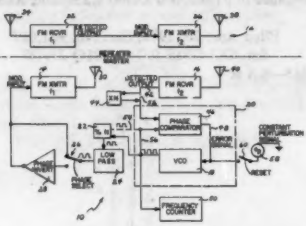
(1) generating a continuous wave at a first carrier frequency;

(2) modulating said continuous wave with a generated modulation signal to produce a modulated continuous wave;

(3) transmitting the modulated continuous wave from a master station;

(4) receiving said modulated continuous wave at a repeater station and retransmitting from the repeater station said modulated continuous wave at a second and different carrier frequency;

(5) receiving said retransmitted modulated continuous wave at the master station;
(6) recovering the modulation signal from said retransmitter modulated continuous wave;
(7) establishing a predetermined phase relationship between the generated modulation signal and the recovered modulation signal;
(8) comparing the phase relationship of said modulation signals;



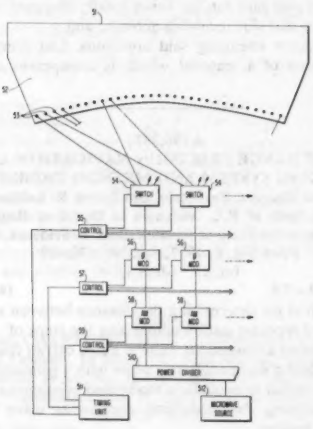
(9) adjusting the frequency of the generated modulation signal until said predetermined phase relationship is obtained;
(10) determining the frequency of said generated modulation signal after said predetermined phase relationship is obtained, said frequency being a function of the distance between said master and repeater station; and
(11) selectively reversing the phase of said generated modulation signal thereby increasing the near range working effectiveness.

4,186,398

MODULATION OF SCANNING RADIO BEAMS

Harry C. Minnett, Castle Cove, and Brian F. C. Cooper, Turramurra, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Continuation-in-part of Ser. No. 694,126, Jun. 8, 1976, abandoned. This application Mar. 29, 1978, Ser. No. 891,359
Claims priority, application Australia, Jun. 9, 1975, PC1919
Int. Cl.[2] G01S *1/16, 1/54*
U.S. Cl. 343—100 SA **7 Claims**



1. Apparatus for use in generating a scanning radio beam with a commutated aerial comprising: a plurality of amplitude modulators and a plurality of phase modulators, each amplitude modulator being connected in series with a respective phase modulator; an r.f. power generator connected to supply an r.f. signal to each amplitude modulator and phase modulator pair; and control means connected to each said amplitude modulator and phase modulator pair to effect complex modulation of the r.f. signal sequentially applied to a group of adjacent feed elements of the aerial in accordance with a predetermined function, wherein said control means comprises a timing unit for generating timing pulses and first and second control devices responsive to said timing pulses for respectively controlling said amplitude modulators and said phase modulators, said first and second control devices each having programmable ready-only memories which are programmed in accordance with said predetermined function to generate control waveforms for said amplitude modulators and said phase modulators in an overlapping sequence, said predetermined function being obtained by the steps of:
(i) specifying a required far field composite beam pattern, $f(\theta)$, produced by the excited group of feed elements, and computing its Fourier transform F(x),
(ii) obtaining the far field pattern, $e(\theta)$, produced by a single excited feed element, and computing the Fourier transform thereof, E(x),
(iii) computing the function M(x), given by

$$M(x)=F(x)/E(x)$$

(iv) performing an inverse Fourier transformation on M(x) to obtain the continuous feed excitation function $m(\theta)$,
(v) sampling $m(\theta)$ at intervals corresponding to the feed element spacing in order to determine the relative excitation of each feed element in the excited group,
(vi) truncating the function $m(\theta)$ to an interval corresponding to the number of instantaneously excited feed elements, and
(vii) selecting a feed element spacing small enough and a truncation interval large enough to ensure that negligible deterioration of $f(\theta)$ occurs.

4,186,399

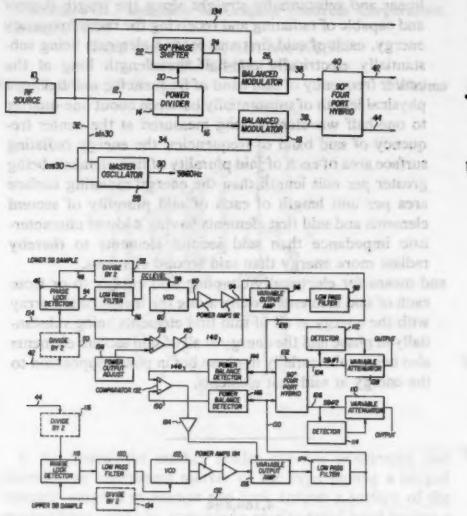
GONIOMETER CIRCUIT FOR VOR SYSTEM

Carl E. Schwab, Huntington Station, and Joseph A. Hutter, Rocky Point, both of N.Y., assignors to General Signal Corporation, Woodbury, N.Y.

Filed Oct. 27, 1978, Ser. No. 955,321
Int. Cl.[2] G01S *1/08*
U.S. Cl. 343—102 **9 Claims**

1. A goniometer circuit having extremely low modulation harmonic distortion comprising:
signal source means for producing carrier and modulating signals,
signal combining means coupled to said signal source means for producing unmodulated sideband signals,
phase lock detector means coupled to said signal combining means for monitoring the frequency and phase of said sideband signals and for producing an output in response thereto,
voltage controlled oscillator means coupled to said phase lock detector for generating an undistorted output in

response to said output of said phase lock detector means; and



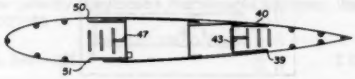
power amplifier means coupled to said voltage controlled oscillator means for amplifying the output signal power of said voltage controlled oscillator means.

4,186,400

AIRCRAFT SCANNING ANTENNA SYSTEM WITH INTER-ELEMENT ISOLATORS

Justine D. Cermignani, Fort Salonga, and Frederick M. Ganz, Nesconset, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jun. 1, 1978, Ser. No. 911,465
Int. Cl.[2] H01Q *1/28, 3/26*
U.S. Cl. 343—708 **15 Claims**



1. An antenna system construction mounted in the wing of an airfoil comprising:

a leading H-plane array of directional elements mounted in the leading edge of an aircraft wing,

a trailing H-plane array of directional elements mounted in the trailing edge of the aircraft wing,

a plurality of parasitic reflecting rods, said rods being interposed in spaced relation to said elements in each of said forward and said trailing H-plane arrays, said rods being dimensioned and spaced from said H-plane directional elements as to regulate the mutual coupling between elements of said H-plane arrays such that high interelement isolation is maintained throughout a broad angular sector,

an E-plane array of directional elements mounted in the leading edge of the aircraft wing adjacent to said leading H-plane array,

an E-plane array of directional elements mounted in the trailing edge of the aircraft wing adjacent to said trailing H-plane array,

means for applying electrical signals to each of said arrays, and

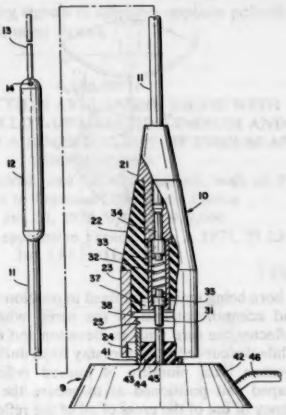
means for shifting the relative phase of said signals in response to a desired direction of scan.

4,186,401

CITIZENS BAND MOBILE ANTENNA MOUNTING STRUCTURE

John Altmayer, Cape Coral, Fla., assignor to Hustler, Inc., Kissimmee, Fla.

Filed Apr. 26, 1978, Ser. No. 900,147
Int. Cl.[2] H01G *1/32*
U.S. Cl. 343—715 **5 Claims**



1. In an upper loaded vertical citizens band radio antenna comprised of upper and lower axially spaced aligned radiating rods; a loading coil intermediate said rods with its end terminals electrically connected to the adjacent ends of said rods and an interconnecting assembly fixed to the bottom of said lower radiating rod, said interconnecting assembly including an upper metallic adapter connected to said lower rod, an insulator having a central bore attached to the lower end of said upper adapter, a metallic lower adapter having a threaded central bore attached to said insulator, the improvement which comprises: spring loaded electrical connection means disposed in said central bore of said insulator comprised of a metallic sleeve having a restricted aperture at its lower end, conducting means engaging said sleeve and said upper adapter, a contact having an extension portion exiting said sleeve through said restricted aperture and an enlarged shoulder portion retained within said sleeve and a spring abutting said contact urging said contact downward.

4,186,402

CASSEGRAINIAN ANTENNA WITH BEAM WAVEGUIDE FEED TO REDUCE SPILLOVER

Motoo Mizusawa, Kamakura; Chikao Kinoshita, Amagasaki; Shinichi Betsudan, Amagasaki, and Sigeru Sato, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 798,170, May 18, 1977, abandoned.
This application Sep. 28, 1978, Ser. No. 946,619
Claims priority, application Japan, May 18, 1976, 51-57503
Int. Cl.[2] H01Q *19/14, 3/12*
U.S. Cl. 343—781 CA **5 Claims**

1. A microwave aerial system comprising:

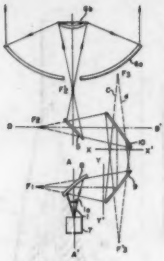
a microwave aerial capable of elevation and azimuthal rotation; and

a primary feed system including:

a microwave horn to generate a rotationally symmetric beam; and

a plurality of reflectors including a plane reflector and

at least one set of three rotationally asymmetric curved reflectors spaced therefrom and comprising one pair of rotationally asymmetric curved reflectors being mirror images of each other and arranged in fixed facing relationship where the said pair of reflectors are together arranged in fixed relationship to the third rotationally asymmetric curved reflector of the said set of three reflectors, whereby the asymmetrical properties are compensated by controlled opposite radiation distribution characteristics so that the electrical field distribution at the aerial aperture is rotationally symmetric;



said horn being maintained fixed in position during elevation and azimuth rotation of the aerial whereas said plane reflector can turn with an elevation and azimuth rotation while the curved reflectors stay fixed during the elevation rotation, said plurality of curved reflectors being so shaped and positioned as to secure the maximum efficiency of use of the areas of all of the reflectors contained within the said aerial system by controlling the divergent nature of the transmitted beam to prevent the spilling-over of microwave radiation.

4,186,403

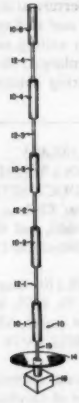
ANTENNA FORMED OF NON-UNIFORM SERIES CONNECTED SECTIONS

Arthur Dorne, Box 624, Setauket, N.Y. 11785

Continuation of Ser. No. 593,951, Jul. 8, 1975, abandoned. This application Jan. 13, 1978, Ser. No. 869,098

Int. Cl.[2] H01Q *9/28*

U.S. Cl. 343—801 **24 Claims**



1. An antenna for transmitting and receiving radio frequency energy over a given band of frequencies comprising

an array formed by a plurality generally cylindrical first and a plurality of generally cylindrical second elongated radiating elements alternately arranged and electrically coupled in series, each of said first and second elements being linear and substantially straight along the length thereof and capable of radiating and receiving the radio frequency energy, each of said first and second elements being substantially electrically one-half wavelength long at the center frequency of said band of frequencies, and having a physical length of substantially between about one-quarter to one-half wavelength long measured at the center frequency of said band of frequencies, the energy radiating surface area of each of said plurality of first elements being greater per unit length than the energy radiating surface area per unit length of each of said plurality of second elements and said first elements having a lower characteristic impedance than said second elements to thereby radiate more energy than said second elements,

and means for electrically coupling said energy to or from each of said elements serially along the length of the array with the energy at all of said first elements being substantially in phase and the energy at all of said second elements also being substantially in phase but in phase opposition to the energy at said first elements.

4,186,404

TRACING TABLE

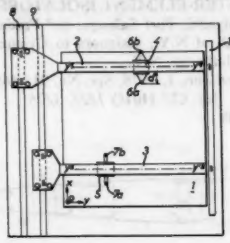
Pierre Guyot, Franconville; Paul Delfau, Villiers le Bel, and Robert Amaury, Gretz Armainvilliers, all of France, assignors to Ifelec, Société Anonyme, Couérbevoie, France

Filed Jul. 19, 1978, Ser. No. 926,124

Claims priority, application France, Jul. 22, 1977, 77 22637

Int. Cl.[2] G01D *9/28*

U.S. Cl. 346—29 **9 Claims**

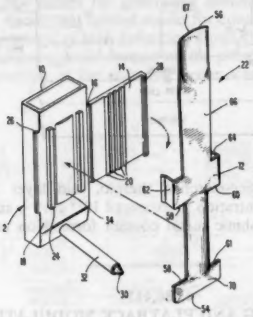


1. A tracing table for simultaneously tracing two independent paths on a same tracing plane, of the type comprising a tracing plane, two arms parallel to each other and to said tracing plane, said arms being disposed on a same side of said tracing plane and movable in a direction X of the tracing plane while remaining parallel to another direction Y of said plane, a carriage movable along each arm, a tracing pen carried by each carriage, and a pen lifting mechanism carried by each arm for raising the corresponding pen to a limited extent, wherein one of said arms referred to herein as the upper arm is mounted for movement in a plane located above the other arm, referred to as the lower arm, with respect to said tracing plane, said upper arm comprising, in addition to said pen lifting mechanism, a pen retraction mechanism capable of retracting the tracing pen of said upper arm up to a level higher than that of said lower arm, and control means connected to said retraction mechanism for actuating same to retract the tracing pen of said upper arm up to said higher level when said upper and lower arms are in a crossing condition, whereby said two arms can cross each other.

4,186,405
MARKER HOLDER CLIP

Joseph Pelensky, Philadelphia, Pa., and Erdman Charles A., Marlton, N.J., assignors to Graphic Controls Corporation, Buffalo, N.Y.

Filed May 5, 1978, Ser. No. 902,937
Int. Cl.[2] G01D *15/16*
U.S. Cl. 346—140 A 7 Claims

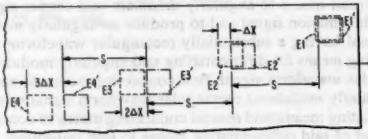


1. An instrument marker holder clip for positioning and retaining an instrument marker of the type having a hinged member adapted to engage and lock against a surface of the marker body, said clip comprising an elongated band having a portion of predetermined width located between the forward and rearward ends of said band, said band also including, at the longitudinal limits of said portion, outwardly extending projections, said portion adapted so that the hinged member of said marker may be locked about said predetermined width portion and positioned against said projections on either side thereof along the length of said clip.

4,186,406
MULTIPLE-ELECTRODE PRINT HEAD FOR ELECTROEROSION PRINTERS

Dietrich J. Bahr, and Karl H. Burckardt, both of Herrenberg, Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 6, 1978, Ser. No. 867,391
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1977, 2727558
Int. Cl.[2] G01D *15/06*
U.S. Cl. 346—163 2 Claims



1. In a print head movable along a print line on a print medium, apparatus for controlling the energization of print electrodes comprising;

a plurality of electrodes in said print head, each being displaced a different predetermined distance along said print line from the leading electrode in said plurality;

coincidence circuit means for each said electrode operable to provide an energizing signal to its said electrode upon occurrence of a pair of coincident input signals and including polarity-sensitive means for connecting pairs of said coincidence circuit means to the respective electrodes thereof through a common control lead with each electrode of said pair arranged to be responsive to a signal having a polarity opposite to that of the other electrode of said pair;

decoding means having a plurality of outputs, each connected to one input of each of said coincidence circuit means and operable upon receipt of binary coded signals for successively providing one of said input signals to a different said coincidence circuit means;

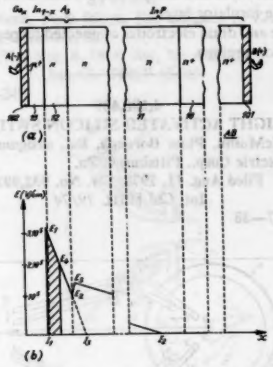
a plurality of address lines connected to said decoding means for providing thereto predetermined binary coded signals; and

a control signal line commonly connected to all of said coincidence circuit means for transmitting thereto electrode energizing signals of selective opposite polarities as another of said input signals.

4,186,407
HETEROJUNCTION AVALANCHE DIODE WITH A TERNARY ALLOY OF GALLIUM, INDIUM AND ARSENIC, AND A BINARY ALLOY OF INDIUM AND PHOSPHORUS

Daniel Delagebeaudeuf, and Thomas Pearsall, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jul. 31, 1978, Ser. No. 929,500
Claims priority, application France, Aug. 2, 1977, 77 23779
Int. Cl.[2] H01L *29/90*
U.S. Cl. 357—13 7 Claims



1. An avalanche diode formed by a heterojunction between a ternary alloy of gallium, indium and arsenic and a binary alloy of indium and phosphorus, comprising a first layer of heavily doped ternary alloy having a first conductivity type, a second layer of weakly doped ternary alloy having a second conductivity type opposite to said first type, a third layer of weakly doped binary alloy having said second conductivity type and a substrate of heavily doped binary alloy having said second conductivity type.

4,186,408
IGFET WITH PARTIAL PLANAR OXIDE

Ronald P. Esch, and Patrick C. Huang, both of Manassas, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 579,102, May 20, 1975, abandoned, which is a division of Ser. No. 411,518, Oct. 31, 1973, Pat. No. 3,899,372. This application Jul. 27, 1977, Ser. No. 819,641
Int. Cl.[2] H01L *29/78*
U.S. Cl. 357—23 1 Claim

1. A field effect transistor device structure comprising

a. a silicon substrate of first conductivity type having a planar surface,

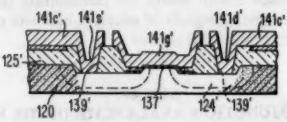
b. diffusion regions of second conductivity type in said

substrate surface, serving as an FET source and drain, having proximate edges separated by a channel region,

c. a recess in said substrate surface within said diffusion regions forming a mesa having a height above the bottom of said recess, containing said channel region,

d. a silicon dioxide gate insulator layer on the top surface and having a portion extending over the edges of said mesa,

e. a dual thickness silicon dioxide insulator layer formed over said recess having a first, relatively thick region



covering a first portion said recess having a thickness approximately thirteen times said height of said mesa, and a second, relatively thin protective extension region extending from said first region to cover a second portion of said recess and to cover said portion of said gate insulator layer extending over said edges of said mesa,

f. a field effect transistor gate electrode overlying said gate insulator layer and said protective extension of said silicon dioxide insulator layer,

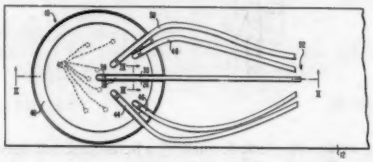
g. source and drain electrodes connected respectively to said diffusion regions.

4,186,409

LIGHT ACTIVATED SILICON SWITCH

Paul G. McMullin, Plum Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 11, 1978, Ser. No. 932,992
Int. Cl.² H01L *29/74*
U.S. Cl. 357—38 **10 Claims**



1. A light activated silicon switch comprising:

(a) a silicon wafer having cathode-emitter, cathode-base, anode-base and anode-emitter regions;

(b) anode and cathode electrodes affixed to said anode and cathode emitter regions respectively;

(c) a plurality of target areas on said cathode emitter region; and

(d) a plurality of light transmitting conduits, each conduit having two end portions, one end portion being adapted to be coupled to a light trigger source, and the other end portion overlying one of said plurality of target areas.

4,186,410

NONALLOYED OHMIC CONTACTS TO N-TYPE GROUP III(A)-V(A) SEMICONDUCTORS

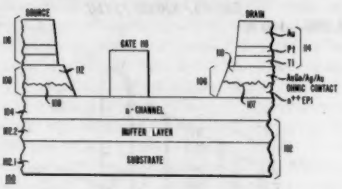
Alfred Y. Cho, Summit; James V. Di Lorenzo, Millington, and William C. Niehaus, Murray Hill, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 27, 1978, Ser. No. 919,624
Int. Cl.² H01L *29/80, 23/48, 29/46*
U.S. Cl. 357—67 **11 Claims**

1. A device comprising

an n-type body of a Group III(a)-V(a) compound semiconductor material,

an n^{++}-layer of a Group III(a)-V(a) compound semiconductor material epitaxially grown on said body and substantially lattice-matched thereto, said layer having a carrier concentration in excess of 10^{19} cm^{-3}, and



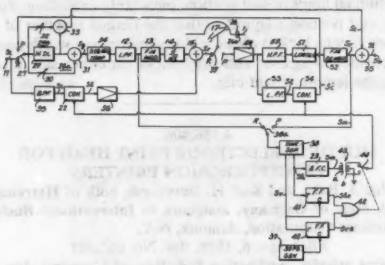
a nonalloyed, ohmic metal contact formed on said n^{++}-layer.

4,186,411

RECORDING AND PLAYBACK MODULATION METHOD AND APPARATUS

Toshihiko Numakura, Kamakura, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 1, 1977, Ser. No. 812,356
Claims priority, application Japan, Jul. 6, 1976, 51/80126
Int. Cl.² H04N *5/76*; G11B *5/02, 5/04*; H04N *5/78*
U.S. Cl. 358—8 **25 Claims**



1. Apparatus for recording an information signal on a recording medium, said apparatus comprising: a transducer; transport means to produce relative movement between said transducer and said recording medium; a source of a carrier signal; circuit means to angularly modulate said carrier signal by said information signal and to produce an angularly modulated signal having a substantially rectangular waveform; differentiating means for differentiating said angularly modulated rectangular waveform signal; first connecting means to apply said angularly modulated rectangular waveform signal to said differentiating means; and second connecting means to connect the output of said differentiating means to said transducer for recording of the differentiated angularly modulated rectangular waveform signal by said transducer on said recording medium.

4,186,412

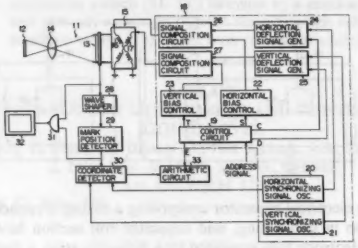
APPARATUS FOR DETECTING THE POSITION OF FINE OBJECT

Yoshiaki Arimura, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Dec. 7, 1977, Ser. No. 858,331
Claims priority, application Japan, Dec. 8, 1976, 51/147487
Int. Cl.² H04N *7/18*
U.S. Cl. 358—101 **9 Claims**

1. An apparatus for detecting the position and inclination of

a fine object having at least two position marks on its surface, said apparatus comprising a television camera having a photosensitive surface, an optical system for focussing a magnified image of the fine object on the photosensitive surface and a scanning means for scanning the photosensitive surface; a scanning signal generator circuit provided to supply a scanning signal to the scanning means of said television camera and including first means for generating horizontal and vertical deflection signals and second means for controlling the amplitude and bias level of each deflection signal, thereby setting the size of a scanning raster formed on the photosensitive surface and the position of the scanning raster scanning a scanning



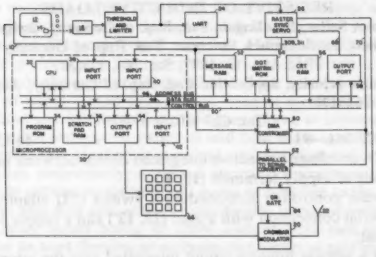
region including at least one of said position marks; a wave shaper for waveshaping the waveform of an image signal generated by said television camera when the photosensitive surface is scanned with said scanning raster; a coordinate detecting means for determining by said scanning means the position of each of said position marks with respect to a fixed point, in response to pulse signals from said wave shaper which correspond to the pattern of the position mark, thereby detecting the coordinate of the position of each said position mark; and an arithmetic operation device for computing the central coordinate and angle of inclination of the fine object based on the data from said coordinate detecting means which represent the coordinates of the two position marks.

4,186,413

APPARATUS FOR RECEIVING ENCODED MESSAGES ON THE SCREEN OF A TELEVISION RECEIVER AND FOR REDISPLAY THEREOF ON THE SAME RECEIVER SCREEN IN A READABLE FORMAT

Thomas J. Mortimer, Amherst, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Nov. 14, 1977, Ser. No. 851,093
Int. Cl.[2] H04N *7/00*
U.S. Cl. 358—146 **11 Claims**



1. Apparatus for receiving optically encoded data transmitted via a broadcast television receiver and superimposed on the normal pictorial information, and for displaying said data in readable format on the screen of said television receiver, comprising:

optically responsive means at the television receiver for receiving the optically encoded data from the screen thereof;

means coupled to said optically responsive means for generating horizontal and vertical synchronization signals in synchronization with the program received by the television receiver;

means coupled to said optically responsive means for processing the encoded data and converting it into a format which allows its display on the screen of the television receiver in a readable format;

means utilizing said generated synchronization signals for establishing synchronization between said processed data and the program received by the television receiver; and

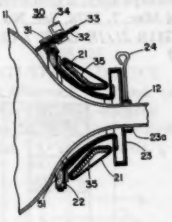
means for coupling said processed-synchronized data to the antenna terminals of the television receiver, so that said data is displayed on the screen of said television receiver in place of a portion of the pictorial information of the broadcast program without extracting the pictorial information and reprocessing it, whereby encoded data can be received and displayed in a readable format in conjunction with an ongoing broadcast program without connection to the inside of the television receiver.

4,186,414

SELF-CONTAINED ADJUSTABLE YOKE MOUNTING SYSTEM

Robert F. Barinek, Park Ridge, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Sep. 5, 1978, Ser. No. 939,510
Int. Cl.[2] H01F *15/02*
U.S. Cl. 358—248 **6 Claims**



1. A low-cost self-converging deflection yoke and mounting system comprising, a core of magnetic material and a lightweight flexible plastic liner sandwiched between rigid horizontal and vertical deflection coils, said yoke having a tapered cross section to generally conform to the funnel and neck of a color picture tube;

clamp means engageable with said liner for securing said yoke on the neck of said picture tube;

adjustment means peripherally disposed on the funnel-end of said liner including screw means and releasable locking means operable in cooperation with said clamp means for maintaining said yoke in different attitudes with respect to the axis of said picture tube;

and means firmly securing said liner, said rigid deflection coils, said core and said adjustment means to each other whereby the mass of said elements renders said liner rigid.

4,186,415

FACSIMILE COMPRESSION SYSTEM

Shoichiro Takayama, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1977, Ser. No. 844,531
Claims priority, application Japan, Oct. 29, 1976, 51-129378
Int. Cl.[2] H04N *7/12*
U.S. Cl. 358—260 **5 Claims**

1. A facsimile compression method comprising the steps of

reading picture information of an original by a whole scanning line, storing said picture information in a first memory, dividing said picture information of a whole scanning line into a plurality of sections, detecting a black cell in each section, storing the binary information concerning whether each section has a black cell in a second memory, selecting either picture information or an f-signal for each section having no

R L	RL CODE
1~4	□×××
5~16	□××□×××
17~64	□××□××□×××
65~256	□××□××□××□×××
257~1024	□××□××□××□××□×××
1025~4096	□××□××□××□××□××□×××

black cell according to the content of said second memory, editing a facsimile signal having a synchronization signal at the beginning of each scanning line, a picture information for each sections having a black cell, and an f-signal for sections having no black cell, and modulating the facsimile signal with an AM.PM.VSB system, and transmitting the modulated signal to a reception station through a communication line.

4,186,416

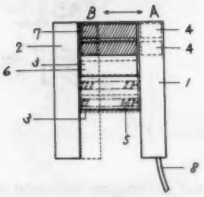
RECORD READING DEVICE FOR MAGNETIZED TAGS

Tatsuzo Nozaki, 22-2 Setogawa-cho, Saga Tenryuji, Ukyo-ku,-Kyoto City, and Yoshihisa Ogawa, 18-28, Kawarakubo, Imazato, Nagaokakyo City, Kyoto Prefecture, both of Japan

Filed Mar. 7, 1978, Ser. No. 884,185

Int. Cl.[2] G11B *21/18*; G06K *7/08*; G11B *25/04*

U.S. Cl. 360—107 **2 Claims**



1. A hand operated type reading device for reading magnetized portions of a tag, such device comprising:

a longitudinally extending fixed member;

a longitudinally extending moving member extending parallel to said fixed member and laterally movable from a first normal position, whereat said moving member is laterally spaced from said fixed member, to a second terminal position whereat said moving member is laterally adjacent said fixed member;

a tag supporting member fixed to said fixed member and extending therefrom, said tag supporting member extending laterally between said fixed member and said moving member when said moving member is in said first normal position thereof, said tag supporting member being adapted to support thereon a flat tag having plural rows of magnetized faces with such faces extending transversely of said fixed member and said moving member;

mounting means for flexibly connecting said moving member to said fixed member and for urging said moving member toward said first normal position thereof; and

plural reading heads mounted on said moving member, said reading heads being adjustable in the longitudinal direction of said moving member for alignment with the rows of magnetized faces of a tag adapted to be supported on said tag suppporting member, such that when said moving member is moved from said first normal position thereof to said second terminal position thereof, said reading heads will move along and read said rows of magnetized faces.

4,186,417

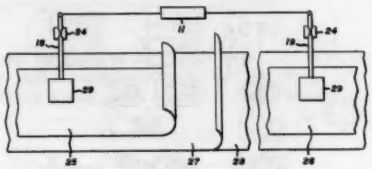
CAPACITOR PROTECTIVE SYSTEM

Frederick W. Grahame, Glens Falls, N.Y., assignor to General Electric Company, Hudson Falls, N.Y.

Filed Dec. 7, 1978, Ser. No. 967,135

Int. Cl.[2] H02H *7/16*

U.S. Cl. 361—15 **15 Claims**



1. In an electrical capacitor comprising a casing, a capacitor roll section in said casing, said capacitor roll section having opposed electrode foils separated by a dielectric strip, a dielectric fluid in said casing, electrical terminals on said casing, and tap means for each said foil electrodes and electrically connecting said opposite foil electrodes to said terminals, the improvement of a three fold electrical protective system for said capacitor comprising,

(a) an electrical circuit interrupter in said casing sensitive to pressure/temperature conditions, and adapted to break the electrical circuit between a terminal and said roll section,

(b) a fuse link in said casing and electrically connected in series with said pressure interrupter and sensitive to overcurrents in said taps to melt in response thereto and break the electric connection,

(c) said tap means being laterally displaced from each other and from the ends of the foil electrodes along their respective electrode foils so that the length of electrode foil from one tap to a position opposite the other tap provides an electrical resistance of less than about 20 ohms in a short circuit through said length of foil which limits the current flow to below that of the rated maximum interruptible current limit of said fuse.

4,186,418

OVERVOLTAGE PROTECTED INTEGRATED CIRCUIT NETWORK, TO CONTROL CURRENT FLOW THROUGH RESISTIVE OR INDUCTIVE LOADS

Hartmut Seiler, Reutlingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 10, 1977, Ser. No. 823,287

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1976, 2638178

Int. Cl.[2] H02H *3/20*

U.S. Cl. 361—91 **14 Claims**

1. Overvoltage protective integrated circuit network having a pair of supply terminals (13, R);

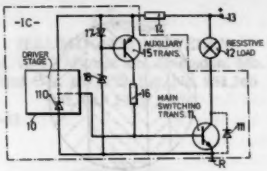
a main controlled semiconductor switch (11) adapted for serial connection with a load (12, 12') and a supply terminal;

and a voltage limiting circuit integrated into the integrated circuit and comprising, in accordance with the invention

an auxiliary transistor (15) having its switching path (emitter-collector) connected to the control terminal of the main controlled semiconductor switch (11);

and voltage sensitive means (18) sensing an overvoltage condition at said supply terminals connected to and con-

trolling the auxiliary transistor to conduction in case of overvoltage to thereby control the main controlled semi-



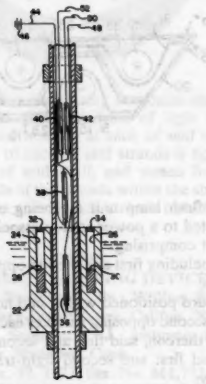
conductor switch (11, 11') likewise to a conductive state and prevent excessive current flow through said voltage sensitive means (18) under overvoltage condition.

4,186,419

APPARATUS FOR MONITORING AND CONTROLLING LIQUID LEVEL

Bobby H. Sims, 417 Illinois St., Hot Springs, Ark. 71901

Filed Nov. 20, 1978, Ser. No. 961,985
Int. Cl.[2] H01H *47/00*
U.S. Cl. 361—178 **8 Claims**



1. An apparatus for monitoring and controlling the level of liquid in a storage tank equipped with a pump to discharge liquid from said storage tank as desired, said apparatus comprising; a tubular guide extending substantially vertically inside said storage tank; a first magnetically operated switch located in said tubular guide; a second magnetically operated switch located in said tubular guide a distance above said first magnetically operated switch; a first electrical current source acting to cause current to pass through said first and second switches when said first and second switches are individually in the closed position and form part of an electrical circuit; a float slidable on the exterior of said tubular guide in response to the level of liquid in said storage tank; magnet means carried by said float and having sufficient magnetic force to activate said first switch and second switch as said float slides on said tubular guide to a location in proximity to said first and second switches, respectively; a second electrical current source to provide current to activate said pump in response to the position of said first and second magnetically operated switches; first relay means acting to allow current from said second source to start flowing to activate said pump as said magnet means activates said second magnetically operated switch, provided that said current to said pump is interrupted in response to said magnet means, activating said first magnetically operated switch; and an alternate second magnetically operated switch located in said tubular guide a distance above said second magnetically operated switch, said alternate switch being in electrical communication with said first current source so that current passes through said switch when said switch is in the closed position and forms part of an electrical circuit, said second current source providing current in response to the position of said alternate switch and provides said current as said magnet means activates said alternate switch, provided that only one of said second switch and said second alternate switch need be activated to start current flowing to said pump.

4,186,420

ACCURATE, FAIL-SAFE RELAY TIMER

Albert E. Van Hise, Park Ridge, N.J., assignor to Otis Elevator Company, New York, N.Y.

Filed Aug. 25, 1978, Ser. No. 936,993
Int. Cl.[2] H01H *47/32*
U.S. Cl. 361—194 **3 Claims**

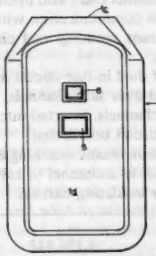
1. Relay timer circuitry comprising:
a source of operating voltage;
a relay coil;
a primary switch for selectively connecting said source of voltage to said relay coil for energizing said relay coil;
a capacitor;
a unilaterally conductive charging circuit connecting said capacitor to said switch means for charging said capacitor with said operating voltage when said primary switch is closed; and
an auxiliary electronic switch connected in series with said capacitor and said relay coil and poled to conduct current from said capacitor, when it is discharging, through said relay coil, said auxiliary electronic switch being biased to conduct when the voltage across said capacitor exceeds a fraction of said operating voltage.

4,186,421

ANTI-STATIC DEVICE

Stephen R. Twitchett, Warwick, England, assignor to Kigass Engineering Ltd., Warwickshire, England

Filed May 26, 1978, Ser. No. 909,958
Int. Cl.[2] H01T *19/04*
U.S. Cl. 361—212 **6 Claims**



1. A manually operable portable device for discharging static on articles, said device comprising a casing for holding in a user's hand, a manually operable actuator mounted in said casing for operation by the user, power supply means connected to switch means operable by said actuator with said actuator being made of electrically conductive material and connected to said power supply means for giving said device a reference ground, a capacitor connected to said power supply means for charging thereby, a transformer of which the primary winding is connected to said capacitor and the secondary winding is connected to a discharge electrode, trigger means connected to said capacitor to trigger said capacitor when the charge stored by said capacitor reaches a predetermined level, and rectifier means connected between said secondary winding

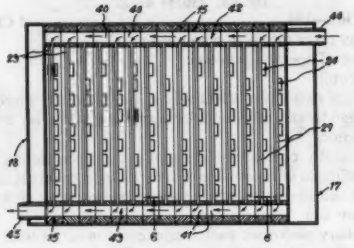
of said transformer and said discharge electrode whereby a pulse charge of given polarity is generated at said discharge electrode when said capacitor discharges through said primary winding of said transformer.

4,186,422

MODULAR ELECTRONIC SYSTEM WITH COOLING MEANS AND STACKABLE ELECTRONIC CIRCUIT UNIT THEREFOR

Lothar Laermer, Paramus, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Aug. 1, 1978, Ser. No. 930,072
Int. Cl.[2] H05K *7/20*
U.S. Cl. 361—388 **14 Claims**



1. A stackable electronic circuit unit for modular electronic systems comprising:

(a) a generally rectangular frame defining a central recess and having first and second end portions, at least one of said end portions having therein a cavity;

(b) a printed circuit board mounted to said frame within said recess;

(c) a plurality of elongated cooling channels extending across said printed circuit board between said end portions within said cavity in paralled spaced relationship, each channel open on both ends, said ends abutting against said first and second end portions;

(d) an opening through each frame end portion at the location of said channel ends, said openings at said at least one end portion in communication with said cavity;

(e) adhesive means securing said channels to said printed circuit board;

(f) a plurality of dual in-line circuit modules with extending leads disposed over said channels, with leads on opposite sides of said channels, inserted into and wave soldered to said printed circuit board; and

(g) second adhesive means attaching each of said duel in-line circuit modules to a channel to enhance heat transfer and prevent an air insulating barrier.

4,186,423

SOLID ELECTROLYTE CAPACITOR USING OXIDE OF RU, RH, RE, OS OR IR AS ELECTROLYTE

Akihiko Yoshida, and Atsushi Nishino, both of Kadoma, Japan, assignors to Matsushita Electric Industrial Company, Limited, Kadoma, Japan

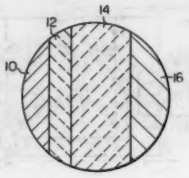
Filed Sep. 30, 1977, Ser. No. 838,236
Claims priority, application Japan, Oct. 1, 1976, 51/118651; Dec. 20, 1976, 51/154008; Jan. 7, 1977, 52/932
Int. Cl.[2] H01G *9/00;* **B01J** *17/00*
U.S. Cl. 361—433 **14 Claims**

1. A solid electrolyte capacitor comprising:

an anode body of a valve metal;

a dielectric oxide film formed on the surface of said anode body by anodization;

a solid electrolyte layer which is formed on said dielectric oxide film and comprises an oxide of a metal selected from the group consisting of ruthenium, rhodium, rhenium, osmium and iridium; and



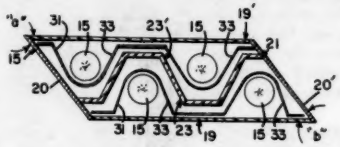
a cathode collector layer formed on said solid electrolyte layer.

4,186,424

PHOTOFLASH UNIT HAVING LAMP ARRAYS ON OPPOSING SIDES

Timothy Fohl, Carlisle, Mass., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Feb. 17, 1978, Ser. No. 878,699
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—13 **13 Claims**



1. A photoflash lamp unit for being electrically activated when connected to a power source associated with a camera, said lamp unit comprising:

a housing including first and second opposing light-transmitting sides;

a circuit board positioned within said housing and including first and second opposing surfaces each having lamp-firing circuitry thereon, said first and second opposing surfaces facing said first and second light-transmitting sides, respectively;

a first plurality of electrically-activated flash lamps located within said housing and positioned on said first opposing surface of said circuit board in electrical contact with said lamp-firing circuitry thereon, said first plurality of flash lamps occupying first and second regions on said first surface of said board;

a second plurality of electically-activated flash lamps located within said housing and positioned on said second opposing surface of said circuit board in electrical contact with said lamp-firing circuitry thereon, said second plurality of flash lamps occupying first and second regions on said first surface substantially opposite said first and second regions on said second surface, respectively; and

first and second mounting devices secured to said housing or forming a part thereof, said first mounting device spacedly positioned from said second regions of lamps on said first and second surfaces of said circuit board by said first regions on said first and second surfaces, respectively, said first mounting device for selectively connecting said lamps in each of said second regions to said power source associated with said camera when said first mounting device is electrically connected to said power source, said second mounting device spacedly positioned from said first regions of lamps on said first and second surfaces of said circuit board by said second regions on said first and second surfaces, respectively, said second mounting device for selectively connecting said lamps in each of said

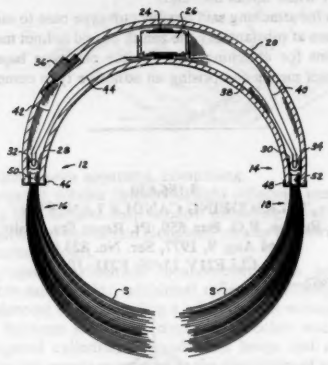
first regions to said power source associated with said camera when said second mounting device is electrically connected to said power source.

4,186,425

ILLUMINATED JEWELRY

Ahmad Nadimi, 12017 Monter Dr., Bridgeton, Mo. 63044

Filed Oct. 16, 1978, Ser. No. 951,360
Int. Cl.² F21L *15/08*
U.S. Cl. 362—32 **5 Claims**



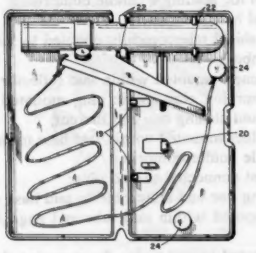
1. An article of jewelry comprising an arcuate shell provided with a pair of spaced ends, a bundle of light transmitting strands attached to said housing at each of said ends in such manner that one face of each of said strands is optically coupled to the interior of said shell, and means for providing illumination to the ends of the strands within the shell whereby to transmit light to the ends of said strands outside the shell.

4,186,426

EMERGENCY LIGHTING DEVICE

Joel A. Gingras, Sr., Doylestown, Pa.; William R. Heffernan, Westfield, N.J.; Mary-Louise Vega, Califon, N.J., and Michael T. Beachem, Somerset, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 19, 1977, Ser. No. 861,772
Int. Cl.² F21V *21/00, 9/16;* F21L *3/00*
U.S. Cl. 362—34 **7 Claims**



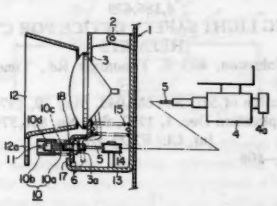
1. An emergency lighting device comprising:
a chemiluminescent lightstick comprising a flexible, translucent outer tube enclosure, and within said outer tube several chemical components of a chemiluminescent mixture separated by frangible means breakable by flexibly bending said outer tube for combining said components to produce chemical light;
an actuating device comprising a fulcram and a lever attached to the outside of said outer tube for manually bending said flexible outer tube against the fulcram of said device by manual cooperation of said tube and lever;
a container defining a storage space within said container for storage at a storage position therein of said lightstick with said attached actuating device, said container comprising a lid operable on a hinge between an open position for access to remove said lightstick with actuating device from said storage space and a closed lid position for enclosing the same within said storage space;
said lid being rotatable on said hinge through 180 degrees from its closed lid position to an open display position at which said lid has been rotated 180° on said hinge from said closed position, and clamping means inside said box for releasably clamping said lightstick at a display position which is different from said storage position, in which display position said lightstick cooperates with said clamping means to hold said lid at said open display position for display of the lightstick.

4,186,427

WIRE LENGTH ADJUSTING DEVICE OF WIRE FOR ADJUSTING HEADLIGHT BEAM

Masao Ishikawa, Yokohama, and Tatuo Nakamura, Tokyo, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama and Ichiko Industries Limited, Tokyo, both of, Japan

Filed Nov. 15, 1977, Ser. No. 851,630
Claims priority, application Japan, Nov. 17, 1976, 51-153189[U]
Int. Cl.² B60Q *1/06*
U.S. Cl. 362—66 **3 Claims**



1. In a motor vehicle:
a vehicle body;
a controller;
a headlight mounting frame having one end hingedly mounted to said vehicle body;
a wire having one end operatively connected to said controller;
an adjust screw threadedly engaging said headlight mounting frame at an area adjacent the other end of the mounting frame, said adjust screw having a head disposed on the outside of said headlight mounting frame; means for connecting one end of said wire to said adjust screw so that said screw can be rotated without rotating said wire; and a member mounted to the vehicle body and disposed on the outside of said headlight mounting frame, said member being formed with an opening to permit a mating tool for turning said adjust screw to reach the head of said adjust screw.

4,186,428

DEVICE FOR ADJUSTING THE INCLINATION OF AUTOMOBILE HEADLIGHTS

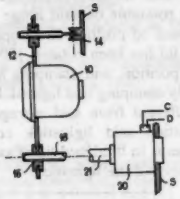
Alain Deverrewaere, La Varenne, France, assignor to Cibie Projecteurs, Bobigny, France

Filed Mar. 2, 1978, Ser. No. 882,842
Claims priority, application France, Mar. 25, 1977, 77 08981
Int. Cl.² F21M *3/22*
U.S. Cl. 362—66 **3 Claims**

1. In a device for the joint control of the inclination of the

headlights of an automobile, including a pair of motor reduction gears mechanically coupled to a pair of headlights, respectively, an electrical circuit including an electrical supply and main switch, the improvement comprising;

a fixed stop switch on each motor reduction gear, said fixed stop switch turning off only when a shaft of the motor reduction gear is positioned according to a predetermined angular sector;



a generator adapted to supply electrical pulses sufficient to start rotation of the motor reduction gears, from their stop position until the closure of the fixed stop switches, the output of the generator being electrically connected between the fixed stop switches and their corresponding motor reduction gears;

the generator being connected to the electrical supply by the main switch.

4,186,429

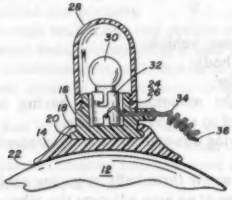
FLASHING LIGHT SAFETY DEVICE FOR CYCLISTS HELMETS

Walter A. Johnston, 403 E. Timonium Rd., Timonium, Md. 21093

Continuation of Ser. No. 688,045, May 19, 1976. This application Dec. 1, 1977, Ser. No. 856,579

Int. Cl.[2] F21Q *5/00*

U.S. Cl. 362—106 **1 Claim**



1. A device for providing safety for cyclists, other motorists, and pedestrians, comprising:

a helmet means;

a flashing light means, comprising a lamp, an electrical socket into which said lamp is inserted, and a flexible electrical cord connected to said electrical socket; and a power source capable of conveying power in pulses to said lamp through said electrical cord and said socket, said power source having a capability of connection to a power system of a cycle with which it may be used for providing safety;

a holding means, for holding said flashing light means, comprising a transparent covering over said lamp, and a socket base coupled to said transparent covering and encircling said electrical socket, said transparent covering being capable of displaying emitted artifical light in a 360° spectrum in any one of a variety of colors, said base being a plastics-like material;

a retaining ring molded monolithically on said socket base;

a flexible cup-type base, having an expandable retaining lip monolithically thereon, said retaining lip expanding as said retaining ring snaps into said cup-type base, thereafter said retaining lip contracting around said retaining ring to hold said socket base in plane, said flexible cup-type base being a rubber-like material with a capability of being contoured at time of installation on the contour of said helmet means, said retaining ring on said socket base arranged so as to snap easily into and out of said retaining lip on said flexible cup-type base for easy and quick disassembly into small parts for convenient storage and transport when not in use; and

means for attaching said flexible cup-type base to said helmet means at substantially the zenith of said helmet means, said means for attaching said flexible cup-type base to said helmet means comprising an adhesive type cement.

4,186,430

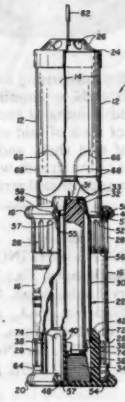
TELESCOPING CANDLE LANTERN

Bruce G. Britton, P.O. Box 659, Pt. Reyes Sta., Calif. 94956

Filed Aug. 9, 1977, Ser. No. 823,073

Int. Cl.[2] F21V *35/00*; F21L *19/00*

U.S. Cl. 362—162 **7 Claims**



1. A lantern for holding a candle comprising:

a cylindrical base member;

a reflector shield telescopically coupled to said cylindrical base member;

a glass chimney mounted within said reflector shield;

a shock absorbing elastomeric plug mounted to said base member and closing one end thereof;

a candle holder mounted within said base member, wherein said candle holder comprises:

a base mount connected to said plug;

a tube having one end attachable to said base mount;

a spring disposed within said tube and engaging said base mount;

a cup connected to said spring for engaging the base of the candle;

said tube including an increasingly thicker, inwardly tapered inner wall portion toward the top end of the tube constructed of a thermally insulative material selected from the group consisting of nylon and Teflon for insulating the candle and engaging the top end of the candle; and

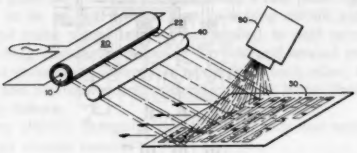
an annular heat conductive metal cap covering the top end of said tube for protecting the top end of said tube and for minimizing the overflow of wax.

4,186,431

LINEAR LIGHT SOURCE

Joseph C. Engel, Monroeville, and George Hines, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 28, 1978, Ser. No. 900,945
Int. Cl.[2] F21S 3/00
U.S. Cl. 362—223 9 Claims



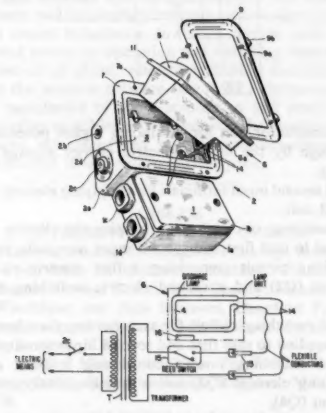
1. A light source apparatus, comprising,
an elongated, tubular cylindrical light reflecting means having a light diffuser strip window extending parallel to the longitudinal axis of said elongated tubular cylindrical light reflecting means,
an elongated cylindrical incandescent lamp positioned within said tubular cylindrical reflecting means, said incandescent lamp including a wire filament means extending between electrodes disposed at either end of said elongated cylindrical incandescent lamp, and electrical excitation means connected to the electrodes of said lamp, said elongated, tubular light reflecting means responding to the electrical excitation of said lamp by reflecting both the actual and virtual images of said wire filament through said light diffuser strip window, said light diffuser strip window projecting a pattern of uniform light intensity.

4,186,432

LAMP FOR USE IN SUBTERRANEAN APPLICATIONS

Martin Hamacher, Külferstr. 5, Waltrop, Fed. Rep. of Germany (4355)

Filed Nov. 21, 1977, Ser. No. 853,804
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1976, 7636602
Int. Cl.[2] H01J 5/52, 5/60, 5/54, 61/50, 61/56; F21V 19/04, 23/04, 25/12
U.S. Cl. 362—226 8 Claims



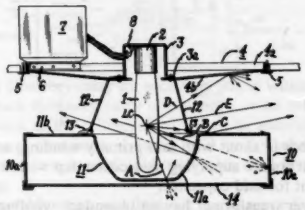
1. A cold-cathode lamp assembly comprising:
a receptacle open at one side;
a lamp unit removably receivable in said receptacle and electrically connected therewith, said unit including:
a housing open at one side,
a cold-cathode discharge tube replaceably received in said housing,
a cover for closing said side of said housing, and
means for sealing said cover to said housing to render said unit dust-free;
means for securing said unit in said receptacle;
a pair of terminals on said receptacle connectable with said unit; and
contactless switch means for de-energizing said terminals upon removal of said unit from said receptacle, said unit having an actuator for open-circuiting said contactless switch means without contact therewith upon displacement of said unit away from said contactless switch means.

4,186,433

LUMINAIRE

Samuel L. Baldwin, East Flat Rock, N.C., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 21, 1978, Ser. No. 879,189
Int. Cl.[2] F21S 3/02; F21V 3/02
U.S. Cl. 362—263 15 Claims



1. A luminaire adapted to be mounted adjacent the ceiling of a room for substantially uniform symmetrical semi-indirect lighting of the room comprising a ceiling panel, a high intensity gaseous discharge lamp mounted on said ceiling panel so as to extend downwardly therefrom, a housing having a surrounding side wall defining an open top and an open bottom, means for suspending said housing from said ceiling panel, said gaseous discharge lamp extending downwardly into said housing, concave means within said housing surrounding the lower portion of said gaseous discharge lamp for transmitting downwardly a portion of the light incident thereon from said lamp and reflecting the remainder of said incident light upwardly and outwardly of said housing for re-direction downwardly by the ceiling, and light diffusing closure means covering the open bottom of said housing, said ceiling panel being arranged for receiving direct light from said lamp and re-directing the same downwardly and outwardly from the luminaire, whereby direct and indirect light is substantially uniformly distributed by the luminaire into the room while shielding the light source from direct view of the room occupants to avoid glare.

4,186,434

MEANS FOR PRODUCING AND CONTROLLING DEAD-TIME OF THE SWITCHING TRANSISTORS DC-TO-DC AND DC-TO-AC CONVERTERS

Philip M. Cowett, Jr., Olney, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 23, 1978, Ser. No. 889,455
Int. Cl.[2] H02M 3/335
U.S. Cl. 363—24 5 Claims

1. In DC-to-DC and DC-to-AC converter circuits including first and second switching transistor means the improvement comprising:
driver circuit means for controlling the dead-time between

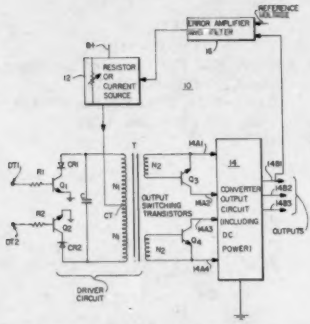
said first and second switching transistor means, comprising:

a source of driver input pulses providing a source of external current;

first and second driver transistor means having base, emitter and collector terminals and being responsive to said input pulses applied to said bases such that the first is ON when the second is OFF and vice versa each of said driver transistors having a 50% duty cycle;

first and second diode means conducting into the collectors of said first and second transistor means;

a driver transformer having a primary winding with a center tap and having its respective ends connected through said diodes to said collectors;



a capacitor in shunt with said primary winding; and

a current source supplying said center tap with a charging current for said capacitor,

said driver transformer having secondary windings driving first and second switching transistors in correlation with said driver transistors;

said charging current being selectively variable to control the dead-time between said first and second switching transistors; and

said driver circuit means controlling said dead-time between said first and second switching transistor means by ensuring that said shunt capacitor is charged solely by said current from said current source means.

4,186,435

DEVICE FOR CONTROLLING A GRAETZ RECTIFIER BRIDGE

Michel Cailloux, Belfort, France, assignor to CGEE Alsthom, Levallois Perret, France

Filed Mar. 22, 1978, Ser. No. 888,902

Claims priority, application France, Mar. 25, 1977, 77 08962

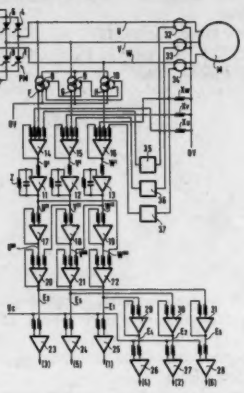
Int. Cl.² H02M 5/45

U.S. Cl. 363—37 **8 Claims**

1. A control device for controlling a Graetz rectifier bridge for connection by its AC terminals to a synchronous polyphase machine which operates at variable speed, the voltage at each of said AC terminals being substantially proportional to its frequency, said Graetz rectifier bridge being composed of a plurality of thyristors grouped in pairs, one pair for each of said AC terminals, each of said thyristors being separately fired by said control device, said control device comprising:

means for supplying a control signal U_c chosen as a function of the required firing angle α for said thyristors to be fired,

means connected to said AC terminals for generating sinusoidal phase reference signals for each phase whose amplitudes are made independent from the operating frequency of said Graetz rectifier bridge, and



comparing means connected to receive said control signal U_c and said sinusoidal phase reference signals for generating the separate firing pulses for each of said thyristors.

4,186,436

BOOSTER CIRCUIT

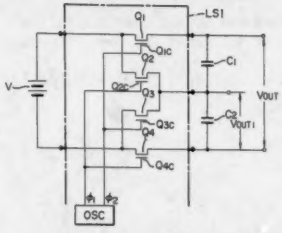
Masumi Ishiwatari, Zushi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1978, Ser. No. 871,746

Claims priority, application Japan, Jan. 27, 1977, 52-8139

Int. Cl.² H02M 7/00

U.S. Cl. 363—60 **6 Claims**



1. Semiconductor unit for producing higher potential than input voltage by the use of electric energy storage means comprising:

first and second input terminals for supplying electric energy to said unit;

a first switching circuit for transmitting the electric energy applied to said first and second input terminals, said first switching circuit comprising a first electric switching element (Q1) and a second electric switching element (Q3);

a second switching circuit for transmitting the electric energy applied to said first and second input terminals, said second switching circuit comprising a third electric switching element (Q2) and a fourth electric switching element (Q4);

a first output terminal electrically connected through the first switching element of said first switching circuit to said first input terminal;

a second output terminal electrically connected through the second switching element of said first switching circuit to

said second input terminal, and connected through the third switching element of said second switching circuit to said first input terminal;

a third output terminal electrically connected through the fourth switching element of said second switching circuit to said input terminal;

(a) first energy storage means coupled between said first output terminal and said second output terminal;

(b) second energy storage means coupled between said second output terminal and said third output terminal; and

a signal generating circuit for generating a first pulse signal train to be applied to said first switching circuit and a second pulse signal train to be applied to said second switching circuit, the pulses of the first and second pulse signal trains being different in phase from each other, and thus said first and second switching circuits being alternatively driven;

whereby electric energy is stored in said first and second energy storage means.

4,186,437

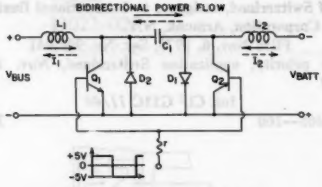
PUSH-PULL SWITCHING POWER AMPLIFIER

Slobodan M. Cuk, Huntington Beach, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed May 3, 1978, Ser. No. 902,725

Int. Cl.[2] H02M *3/335*

U.S. Cl. 363—65 **23 Claims**



1. A switching power stage for producing an output voltage to a load comprised of two dc-to-dc converters with outputs connected to opposite ends of said load for parallel operation in a true push-pull mode from a single DC power source, each converter comprising input and output inductances in series with storage capacitance between the inductances, and bidirectional symmetrical switching means for alternately connecting the junction between said input inductance and said storage capacitance, and the junction between said storage capacitance and said output inductance, to return current paths for said source, and means for operating said switching means for said converters out of phase, whereby while one switching means connects the junction between said input inductance and said storage capacitance of one converter to said return current path, the other switching means connects the junction between said output inductance and said storage capacitance of the other converter to said return current path.

4,186,438

INTERACTIVE ENQUIRY SYSTEM

Paul H. Benson; Michael L. Kingdom-Hockings, both of Chandlers Ford; Brian H. Middleton; Martin C. Pinnell, both of Winchester; Thomas E. Robinson, Romsey; Richard E. Sheeler, Winchester, and John Simmons, Chandlers Ford, all of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 16, 1977, Ser. No. 778,181

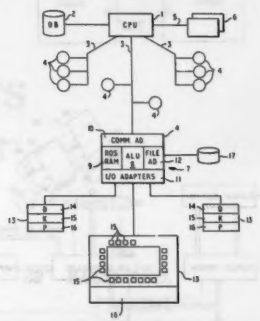
Claims priority, application United Kingdom, Mar. 17, 1976, 10813/76

Int. Cl.[2] G06F *3/04, 7/06, 13/06*

U.S. Cl. 364—200 **11 Claims**

1. In an interactive enquiry system of the type comprising a host data processor, a central data store controlled by the host processor and adapted to store a data base, a plurality of local subsystems connectible to the host processor, each local subsystem including a local data processor for controlling access to the host processor and a local data store comprising a random access memory and a magnetic disk file connected to the local processor and adapted to store part of the data base, at least one enquiry terminal in each local subsystem connected to the local processor for accessing any accessible item in the data base stored in the central store,

wherein the random access memory portion of the local data store is divided into a first part adapted to store items accessed from the data base and a second part adapted to



store a directory entry for each item stored within the first part, each directory entry containing a count which is an indication of the frequency of use of its associated item, said local processor updating said count whenever its associated item is used, said local subsystem further comprising:

means operable when said first part has no space for a newly accessed item to scan the directory entries and determine the least frequently used items, and;

means responsive to said scanning means to delete at least one of said least frequently used items to create sufficient space for the newly accessed item.

4,186,439

ELECTRONIC CASH REGISTER FOR TOTALIZING SALES DATA ON A TIME ZONE BASIS

Noriaki Shimura, and Yutaka Mizuno, both of Murayama, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1977, Ser. No. 865,450

Int. Cl.[2] G06F *15/20*

U.S. Cl. 364—405 **12 Claims**

1. In an electronic cash register, the improvement comprising the combination of:

a keyboard including a data input key and a time zone setting key; a central processing unit coupled to said keyboard;

a memory means coupled to said central processing unit and having a plurality of memory places for storing accumulated sales amounts on a time zone basis;

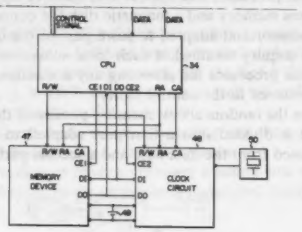
a time memory coupled to said central processing unit to store time zone defining time data by the operation of said time zone setting key;

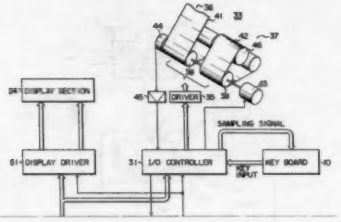
a timepiece coupled to said time memory to supply current time data; and

a comparator coupled to said timepiece and to said time memory to compare current time data from said timepiece with the time data stored in said time memory;

said central processing unit including means for writing

entry data in one memory place of said memory means according to the time zone determined by the result of





comparison by said comparator when entry data from said keyboard is completed.

4,186,440

CONTINUOUS MEMORY SYSTEM

Leo C. Miller, Silver Spring; James A. Perschy, Laurel, both of Md., and Gordon D. Smith, Jr., Atlanta, Ga., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 24, 1966, Ser. No. 552,639

Int. Cl.[2] G11C *5/02*

U.S. Cl. 364—900 **10 Claims**

1. A continuous memory system of a satellite for receiving, storing and transmitting orbital data of the satellite to enable an observer or navigator to determine his position comprising:

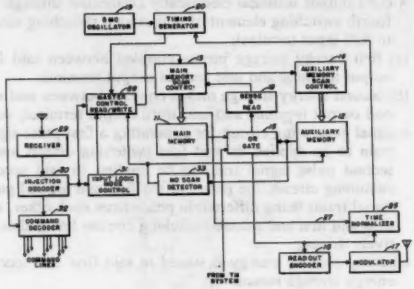
main memory means having a matrix of ferrite cores for storing orbital data of the satellite in digital words;

main memory scan control means connected to said main memory means having a bi-directional current steering switch and an anti-coincidence switch for scanning said main memory matrix sequentially row by row;

accepting means connected to said main memory matrix for receiving digital words stored in said main memory matrix and for feeding said words to a transmitter, said accepting means being connected to said main memory scan control means for restoring said main memory words to the same position in said main memory matrix;

oscillator means for supplying a nominal stable signal;

timing generating means connected to said oscillator means having dividing means for operating on said signal establishing both scan and load rate signals for the continuous memory system.



4,186,441

MAGNETIC VORTEX GENERATOR WITH A VORTEX POOL AND SINGLE VORTEX TRANSFER

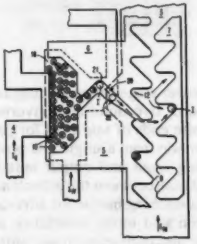
Werner Baechtold, Langnau, and Pierre Gueret, Richterswil, both of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 6, 1978, Ser. No. 957,941

Claims priority, application Switzerland, Nov. 14, 1977, 13830/77

Int. Cl.[2] G11C *11/44*

U.S. Cl. 365—160 **25 Claims**



1. Apparatus for storing single flux quantum vortices comprising:

means for generating a plurality of single flux quantum vortices having at least one of a given and opposite dipole direction,

means for pooling said plurality of single flux quantum vortices disposed adjacent said means for generating,

means for shifting at least one of said plurality of single flux quantum vortices, and

means for transferring said plurality of single flux quantum vortices one at a time from said means for pooling to said means for shifting interconnecting said means for pooling and said means for shifting.

DESIGN PATENTS

GRANTED JAN. 29, 1980

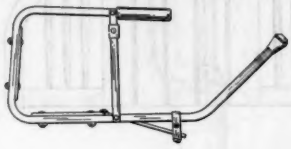
ERRATA

For CLASS	See PATENT NO.
D022–025	254,091
D021–236	254,093

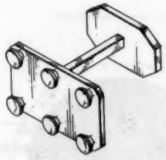
DESIGNS

JANUARY 29, 1980

254,036
TABLE ATTACHABLE SEAT FOR A CHILD
George J. Euwema, 1880 NW. 40 Ct., and George W. Euwema, 1920 NW. 40 Ct., both of Ft. Lauderdale, Fla. 33309
Filed Dec. 9, 1977, Ser. No. 859,228
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—9

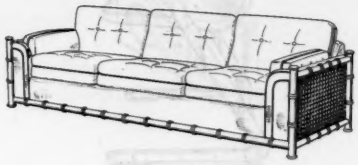


254,037
SOAP BAR HOLDER
Ivan D. Woods, 18119-3 Camino Bello, Rowland Heights, Calif. 91745
Filed Nov. 30, 1978, Ser. No. 965,030
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—27

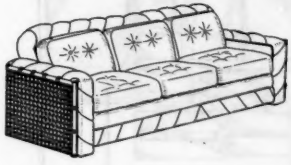


254,038
CHAIR
Isao Hosoe, Milan, Italy, assignor to Sacea S.a.s. di Tirinnanzi Giampietro & C., Legano, Italy
Filed Aug. 25, 1977, Ser. No. 827,829
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

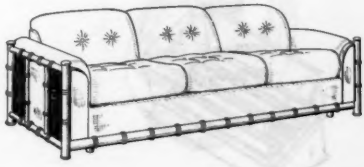
254,039
SOFA
Lester Beall, High Point, N.C., assignor to Modern Angel Furniture Manufacturing, Inc., Paramount, Calif.
Filed Dec. 6, 1977, Ser. No. 857,927
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—57



254,040
SOFA
Lester Beall, High Point, N.C., assignor to Modern Angel Furniture Manufacturing, Inc., Paramount, Calif.
Filed Dec. 6, 1977, Ser. No. 857,928
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—57

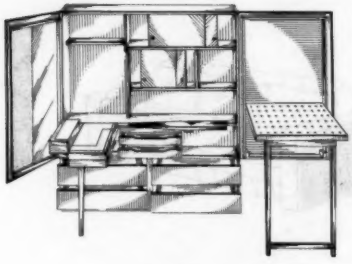


254,041
SOFA
Lester Beall, High Point, N.C., assignor to Modern Angel Furniture Manufacturing, Inc., Paramount, Calif.
Filed Dec. 6, 1977, Ser. No. 857,929
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—57

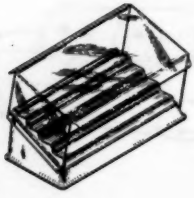


254,042
CHAIR
Isao Hosoe, Milan, Italy, assignor to Sacea S.a.s. di Tirinnanzi Giampietro & C., Legano, Italy
Filed Aug. 25, 1977, Ser. No. 827,815
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69

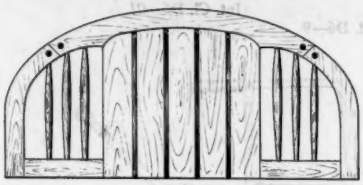
254,043
MULTI-USE SEWING CABINET
Donald M. Genaro, Haworth, and Robert S. Peets, Watchung, both of N.J., assignors to The Singer Company, New York, N.Y.
Filed Oct. 25, 1977, Ser. No. 845,506
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—164



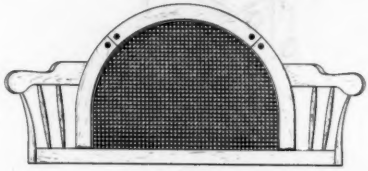
254,044
DISPLAY CASE
Loren J. Lawson, 7358 18th Ave., Seattle, Wash. 98117
Filed May 24, 1976, Ser. No. 689,139
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—173



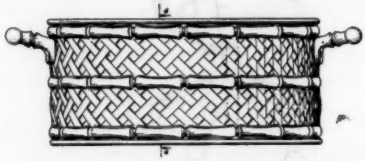
254,045
HEADBOARD
Huey T. Keller, High Point, N.C., assignor to Vaughan Furniture Company, Inc., Galax, Va.
Filed Aug. 8, 1977, Ser. No. 822,617
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—198



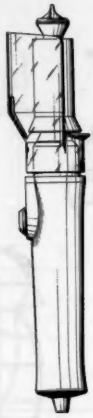
254,046
HEADBOARD
Huey T. Keller, High Point, N.C., assignor to Vaughan Furniture Company, Inc., Galax, Va.
Filed Aug. 8, 1977, Ser. No. 822,618
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—198



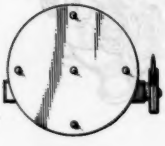
254,047
CASSEROLE HOLDER
Stuart A. Young, Meriden, Conn., assignor to International Silver Company
Filed Jun. 29, 1977, Ser. No. 811,154
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—39



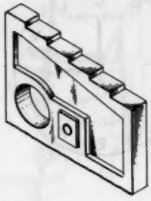
254,048
ELECTRIC PEELING WAND OR SIMILAR ARTICLE
Max C. Hauenstein, Monroe, Conn., assignor to General Electric Company
Filed Dec. 19, 1977, Ser. No. 861,661
Term of patent 3½ years
Int. Cl. D7—*04*
U.S. Cl. D7—139



254,049
ARCUATE CUTTING TOOL
Lloyd E. Anderson, 6408 74th Ave. North, Brooklyn Park, Minn. 55428
Filed Jun. 13, 1977, Ser. No. 806,019
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—98

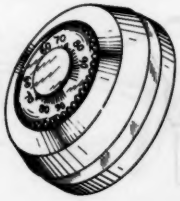


254,050
WEDGE TO HOLD A GAS PUMP NOZZLE IN THE OPEN POSITION
Harry H. Fitzgerald, 16023 47th Ave. S., Seattle, Wash. 98188
Filed Nov. 10, 1977, Ser. No. 850,401
Term of patent 14 years
Int. Cl. D8—*08;* D15—*02;* D23—*01*
U.S. Cl. D8—349



254,051
SNOW GUARD
Joseph D. Zaleski, 100 Brookside Rd., New Britain, Conn. 06052
Filed Nov. 16, 1978, Ser. No. 961,220
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—499

254,052
ROOM THERMOSTAT OR SIMILAR ARTICLE
Norbert T. Wolfe, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Jun. 20, 1977, Ser. No. 807,851
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—51

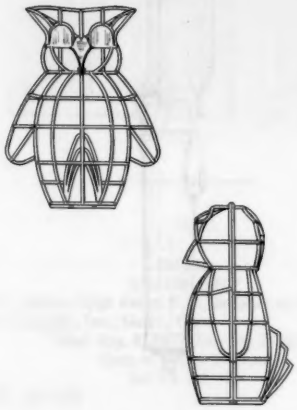


254,053
COMBINED WATCH FACE AND HANDS
Billie C. Tripod, 1974 Meadowview La., Memphis, Tenn. 38116
Filed Sep. 22, 1977, Ser. No. 835,834
Term of patent 7 years
Int. Cl. D10—*07*
U.S. Cl. D10—124

254,054
NECKLACE OR SIMILAR ARTICLE
Josef J. Barr, 125 Worth Ave., Suite 300, Palm Beach, Fla. 33480
Filed Oct. 13, 1977, Ser. No. 841,746
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—6

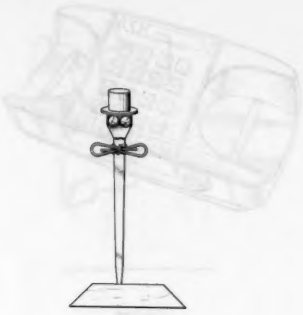
254,055
EAR CLIP
Pasquale E. Pisano, Johnston, R.I., and James Demers, Garden City, N.Y., assignors to Alice Jewelry, Providence, R.I.
Filed Oct. 11, 1977, Ser. No. 840,982
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—88

254,056
THREE DIMENSIONAL TOPIARY FIGURE
William T. Bales, Whitehouse, Ohio, assignor to Plantables, Inc., Toledo, Ohio
Filed Oct. 16, 1978, Ser. No. 952,000
Term of patent 14 years
Int. Cl. D11—*02*; D21—*02*
U.S. Cl. D11—149

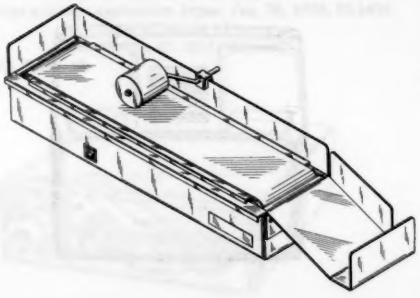


254,057
RABBIT FIGURE
Jean W. Heap, Pwllheli, Wales, assignor to Pendelfin Studios Limited, Burnley, England
Filed Oct. 11, 1977, Ser. No. 841,081
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

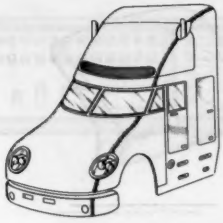
254,058
FIGURINE
A. Edward Langlois, Jr., P. O. Box 161, Downtown Station, Portland, Me. 04112
Filed Mar. 16, 1978, Ser. No. 887,197
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—160



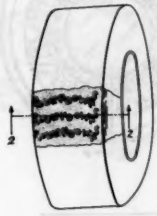
254,059
ENVELOPE POWER STACKER
Edward A. Krupotich, Palo Alto, Calif., assignor to Omation Corporation, Palo Alto, Calif.
Filed Mar. 17, 1978, Ser. No. 887,736
The portion of the term of this patent subsequent to Jan. 2, 1993, has been disclaimed.
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D12—58



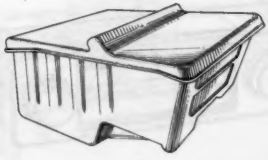
254,060
TRUCK CAB
Charlene Spellins, and Richard E. Muraski, both of 1413 Robertson Blvd., Chowchilla, Calif. 93610
Filed Nov. 10, 1977, Ser. No. 850,085
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—96



254,061
TIRE
Joseph B. Nadler, 7657 Greenland Pl., Cincinnati, Ohio 45237
Filed May 5, 1977, Ser. No. 793,961
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—137



254,062
ARTICLE CARRIER FOR MOTOR-BIKE
Marta K. Anton, One Gateway Center, S. 605, Newton, Mass. 02158
Filed Sep. 30, 1977, Ser. No. 838,251
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—158



254,063

AIR DEFLECTOR FOR TRUCKS

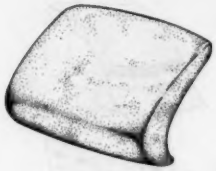
Robert C. Anziano, Irvine, Calif., assignor to Transportation Special Products Inc., Los Angeles, Calif.

Filed Jan. 3, 1978, Ser. No. 866,611

Term of patent 14 years

Int. Cl. D12—*16*

U.S. Cl. D12—181



254,064

SPOKED VEHICLE WHEEL

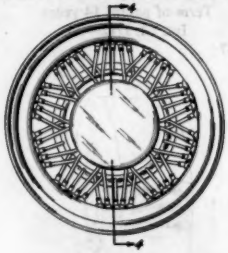
Ronald D. Retzlaff, Anaheim, Calif., assignor to Tru-Spoke, Inc., Anaheim, Calif.

Filed Jun. 1, 1978, Ser. No. 911,442

Term of patent 14 years

Int. Cl. D12—*16*

U.S. Cl. D12—205



254,065

COMBINED MOTOR VEHICULAR CARTRIDGE OR CASSETTE PLAYER AND CITIZENS' BAND TRANSCEIVER OR THE LIKE

Kikuo Ohta; Toshio Igo, both of Katano, and Satoru Usami, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

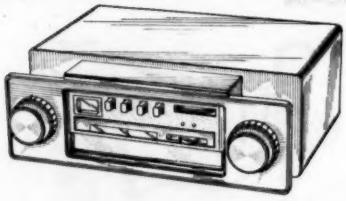
Filed Jul. 20, 1977, Ser. No. 817,288

Claims priority, application Japan, Jan. 20, 1977, 52-1485

Term of patent 14 years

Int. Cl. D14—*01, 03*

U.S. Cl. D14—5



254,066

TELEPHONE FOR VEHICLES

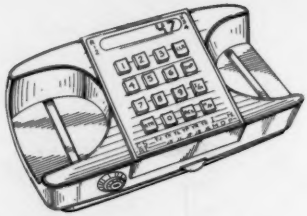
Russell H. Kohlman, 146 E. Hickory Grove Rd., Bloomfield Hills, Mich. 48013

Filed Feb. 13, 1978, Ser. No. 877,417

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—53



254,067

TELEPHONE INSTRUMENT HOUSING

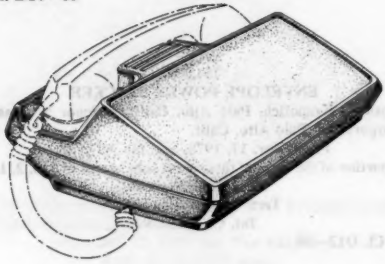
George M. Janda, Westchester, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

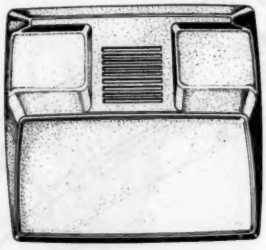
Filed Dec. 23, 1977, Ser. No. 863,658

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—60



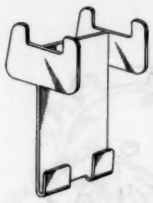


254,068

TELEPHONE INSTRUMENT SUPPORTED HAND SET HOLDER

Ellis R. Haley, 385 Old Connecticut Path, Framingham, Mass. 01701

Filed Jul. 15, 1977, Ser. No. 815,924
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—65

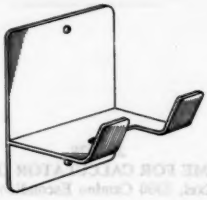


254,069

WALL ATTACHABLE TELEPHONE HAND SET HOLDER

Ellis R. Haley, 385 Old Connecticut Path, Framingham, Mass. 01701

Filed Jul. 15, 1977, Ser. No. 815,925
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—65

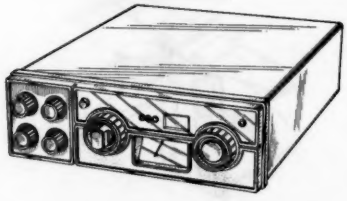


254,070

MOTOR VEHICULAR CITIZENS' BAND TRANSCEIVER

Toshio Igo, and Kikuo Ohta, both of Katano, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 20, 1977, Ser. No. 817,289
Claims priority, application Japan, Jan. 20, 1976, 52-1476
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68

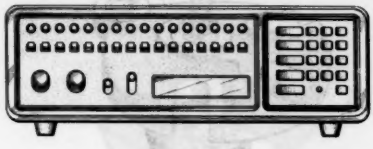


254,071

DIGITAL ENTRY PROGRAMMABLE SCANNING RADIO RECEIVER OR THE LIKE

Kazuyoshi Imazeki, Tokyo, Japan, assignor to General Research of Electronics, Inc., Tokyo, Japan

Filed Dec. 15, 1977, Ser. No. 860,887
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—71

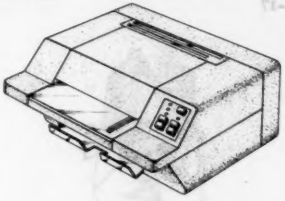


254,072

FACSIMILE WITH TRANSCEIVER

Yasuhiro Saito, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Aug. 1, 1977, Ser. No. 820,806
Claims priority, application Japan, Jan. 31, 1977, 52-2885
Term of patent 7 years
Int. Cl. D14—*01, 03*
U.S. Cl. D14—94

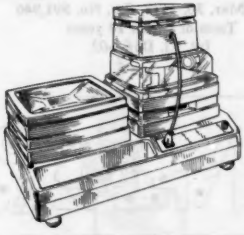


254,073

HOT WATER EXTRACTION RUG CLEANER

John T. Clifton, Bowmanville, Canada, assignor to CS Yachts Limited, Brampton, Canada

Filed Dec. 5, 1977, Ser. No. 857,796
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—52



254,074

DRILL GUIDE FOR REMOVING BROKEN STUDS FROM AUTOMOTIVE MANIFOLDS

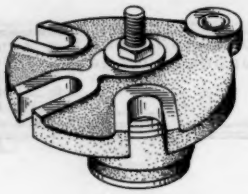
Gerald D. Ringle, 3025 W. U.S. 12, Michigan City, Ind. 46360

Filed Aug. 11, 1978, Ser. No. 933,123

Term of patent 14 years

Int. Cl. D15—*09*

U.S. Cl. D15—138



254,075

PHOTOGRAPHIC ILLUMINATING AND COMPARING DEVICE

Gary Bartholomew, Des Plaines, Ill., assignor to Bartholomew Mfg. Co., Inc., Des Plaines, Ill.

Filed Oct. 31, 1977, Ser. No. 847,392

Term of patent 14 years

Int. Cl. D16—*02*

U.S. Cl. D16—17

254,076

MALFUNCTION DISPLAY PANEL FOR XEROGRAPHIC COPYING MACHINE

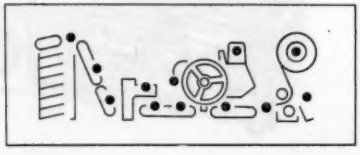
Fred J. Breitenkam, Randolph, and James E. Landrith, Andover, both of N.J., assignors to Van Dyk Research Corporation, Whippany, N.J.

Filed Mar. 30, 1978, Ser. No. 891,946

Term of patent 14 years

Int. Cl. D16—*03*

U.S. Cl. D16—32



254,077

CLAW-BALL FOR USE WITH A CAMERA MOUNTING

Ray S. Clementson, Sydney, Australia, assignor to R. E. Miller Pty. Limited, Sydney, Australia

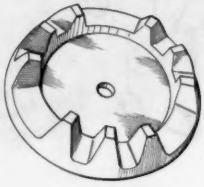
Filed Jun. 29, 1977, Ser. No. 811,454

Claims priority, application Australia, Mar. 28, 1977, 71491

Term of patent 14 years

Int. Cl. D16—*05*

U.S. Cl. D16—46



254,078

SLIDE FRAME FOR CALCULATOR OR THE LIKE

Gerrit A. Van Exel, 2300 Camino Escondido, Fullerton, Calif. 92633

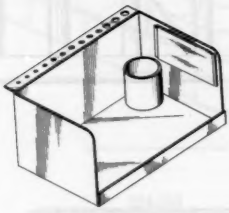
Filed Jun. 20, 1977, Ser. No. 808,239

Term of patent 14 years

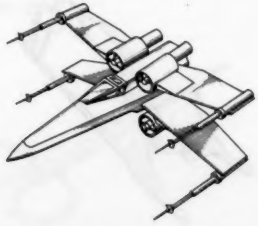
Int. Cl. D19—*99*

U.S. Cl. D18—9

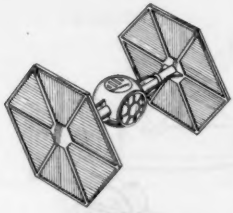
254,079
ATTACHABLE HOLDER FOR TOOLS AND ACCESSORIES FOR A PRINTING PRESS OR THE LIKE
Benjamin J. Berghoff, 16344 Vintage St., Sepulveda, Calif. 91343
Filed Nov. 17, 1977, Ser. No. 852,309
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D18—22



254,080
TOY SPACECRAFT
Joseph Johnston, North Hollywood, and Colin Cantwell, Newhall, both of Calif., assignors to Twentieth Century-Fox Film Corporation
Filed Sep. 12, 1977, Ser. No. 832,518
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—87

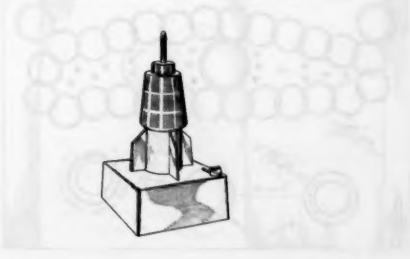


254,081
TOY SPACECRAFT
Joseph Johnston, North Hollywood, and Colin Cantwell, Newhall, both of Calif., assignors to Twentieth Century-Fox Film Corporation
Filed Sep. 12, 1977, Ser. No. 832,543
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—87



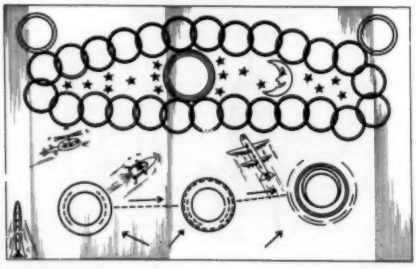
254,082
TOY WRITING INSTRUMENT
Jeffrey M. Koblick, Minnetonka, Minn., assignor to K-tel International, Inc.
Filed Jan. 3, 1978, Ser. No. 866,717
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—127

254,083
COMBINED TOY WRITING INSTRUMENT AND STAND THEREFOR
Jeffrey M. Koblick, Minnetonka, Minn., assignor to K-tel International, Inc.
Filed Jan. 3, 1978, Ser. No. 866,718
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—127

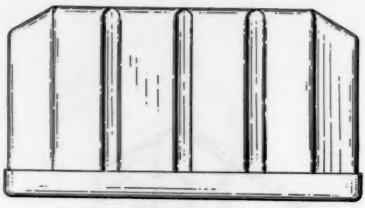


254,084
GOLF CLUB HEAD
Myron Hulyk, 20037 Edmunton, St. Clair Shores, Mich. 48080
Filed Mar. 6, 1978, Ser. No. 883,691
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—217

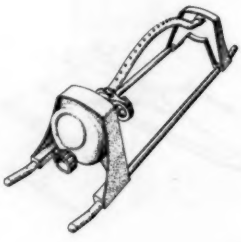
254,085
GAMEBOARD
Beulah O. Houck, 22648 Covello St., Canoga Park, Calif. 91307
Filed Aug. 1, 1977, Ser. No. 820,842
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—241



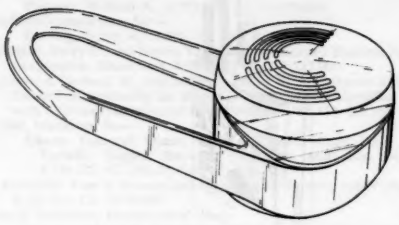
254,086
FUEL OIL FILTER
David H. Hodgkins, Manchester, Conn., assignor to Stanadyne, Inc.
Filed Apr. 22, 1977, Ser. No. 789,973
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4



254,087
LAWN SPRINKLER
Roland Dadson, Thame, England, assignor to Hozelock Limited, Buckinghamshire, England
Filed Sep. 7, 1977, Ser. No. 831,135
Claims priority, application United Kingdom, Mar. 15, 1977, 979271
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—8



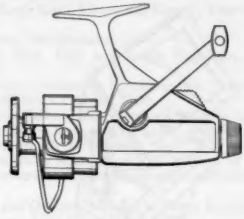
254,088
HANDLE FOR A WATER FAUCET
Andreas Haug, Altensteig, Fed. Rep. of Germany, assignor to Hans Grohe GmbH & Co. KG, Fed. Rep. of Germany
Filed Sep. 8, 1978, Ser. No. 941,332
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1978, MR 934 Ob; Apr. 28, 1978, MR 944 Ob
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—29



254,089
TOILET EXHAUSTER
Lambert D. Berry, Rte., Box 233, Silverdale, Wash. 98383
Filed Jun. 15, 1977, Ser. No. 806,779
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—69

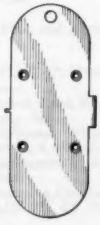
254,090
SURGICAL INSTRUMENT
Angelo Perry, Stratford, Conn., assignor to Acme United Corporation, Bridgeport, Conn.
Filed May 14, 1975, Ser. No. 577,191
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—27

254,091
FISHING REEL
Bertil E. Jansson, Karlshamn, and Karl L. O. Carlsson, Asarum, both of Sweden, assignors to Abu Aktiebolag, Svangsta, Sweden
Filed Dec. 7, 1977, Ser. No. 858,498
Claims priority, application Sweden, Jun. 9, 1977, 77-1286
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25



254,092
TERMINAL POST
Ross J. Slade, London, England, assignor to Northern Telecom Limited, Montreal, Canada
Filed Apr. 3, 1978, Ser. No. 893,176
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—77

254,093
UNDERWATER CONSOLE ATTACHING SLATE BOARD
Ronald J. Adams, 365 Mulberry, Southgate, Mich. 48195
Filed Apr. 6, 1977, Ser. No. 785,236
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—236

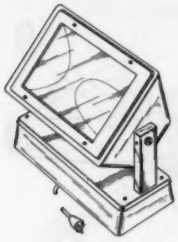


254,094

ADJUSTABLE FLOODLIGHT

Milenko Jaksich, Burbank, Calif., assignor to Sight Lite, Inc., Los Angeles, Calif.

Filed Jun. 13, 1977, Ser. No. 803,422
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—20 K



254,095

TOY BANK

David W. Wurster, 1750 Henaman Heights, Williamsport, Pa. 17701

Filed Feb. 23, 1978, Ser. No. 880,630
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D99—37

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF JANUARY, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Dick Company: *See*—
Wachtel, Joseph, 4,186,020, Cl. 106-22.000.

A-T-O Inc.: *See*—
Prescott, William A., 4,185,426, Cl. 52-115.000.

AB Halldemaskiner: *See*—
Durling, Bengt, 4,185,788, Cl. 241-285.00A.

Abbott, Perry E.; and Noyes, Trigg, to International Business Machines Corporation. Sheet feed. 4,185,815, Cl. 271-225.000.

Aberson, Gerhard M.; and Stulgate, Emily M., to Johnson & Johnson. Method of producing an absorbent panel having densified portion with hydrocolloid material fixed therein. 4,186,165, Cl. 264-112.000.

Abo, Masahiro: *See*—
Okada, Yasunori; Osada, Yuichi; Nakano, Mineo; Kasai, Shozo; Tachiki, Shigeo; Hayashi, Nobuyuki; and Abo, Masahiro, 4,186,122, Cl. 260-31.40R.

Abramsen, Finn B. Process and apparatus for forming cold finished bar. 4,185,484, Cl. 72-40.000.

ACF Industries, Incorporated: *See*—
Stoller, Patricia S.; Hammonds, James C.; Kloepper, John O.; and Schlobohm, Arnold, 4,185,564, Cl. 410-64.000.

Acher, Jacques: *See*—
Thominet, Michel; Bulteau, Gerard; Acher, Jacques; and Colignon, Claude, 4,186,135, Cl. 260-326.340.

Acker, Loren C., to Engineering & Research Associates, Inc. Desk mounted tube sealer. 4,186,292, Cl. 219-10.810.

Acker, William F., to Honeywell Inc. Signal bias remover apparatus. 4,186,384, Cl. 340-347.0AD.

Action Films, Inc.: *See*—
Sherlock, Hugh P.; Ewry, Edwin E.; Sandvoss, Werner E.; Ciupke, Werner W.; Brown, Glenn E.; and Link, William T., 4,185,899, Cl. 352-72.000.

Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, to Agence Nationale de Valorisation de la Recherche (ANVAR). Water soluble agents effective as immunological adjuvants for stimulating, in the host the immune response to various antigens and compositions, notably vaccines containing said water soluble agents. 4,186,194, Cl. 424-89.000.

Adams, Carl. Bendible bracket. 4,185,566, Cl. 108-152.000.

Adams, Clyde M., Jr. Apparatus for separation, refinement, extraction and/or concentration by liquation. 4,185,468, Cl. 62-123.000.

Adret Electronique: *See*—
Remy, Joel, 4,186,356, Cl. 332-19.000.

Adrian, Fritz, to Balcke-Durr Aktiengesellschaft. Safety device for sail yachts. 4,185,346, Cl. 9-1.700.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,186,194, Cl. 424-89.000.

Agfa-Gevaert Aktiengesellachaft: *See*—
Lohmann, Joachim W.; Ranz, Erwin; and Kupper, Martin, 4,186,011, Cl. 430-505.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Bergthaller, Peter; von Bonin, Wulf; Helling, Gunter; and Marx, Paul, 4,186,014, Cl. 430-213.000.
Kunitz, Friedrich-Wilhelm; and Salzmann, Heinz, 4,186,019, Cl. 430-557.000.
Lohmann, Joachim W.; Lapp, Otto; and Boie, Immo, 4,186,016, Cl. 96-74.000.
Meckl, Heinz; and Lohmer, Karl, 4,186,007, Cl. 430-467.000.
Odenwalder, Heinrich; Puschel, Walter; Pollet, Robert J.; and Ranz, Erwin, 4,186,012, Cl. 430-544.000.

Agfa-Gevaert, N.V.: *See*—
Florens, Raymond L.; and Timmerman, Daniel M., 4,186,010, Cl. 430-627.000.

Agui, Wataru; Higosaki, Nobuyuki; Yamanari, Koichiro; Furukawa, Toshio; and Kuyama, Hiroshi, to Rohm and Haas Company. Granular flocculants and their manufacture. 4,186,167, Cl. 264-141.000.

Aiba, Masahiko: *See*—
Umeda, Ikuo; Aiba, Masahiko; and Kimura, Kozo, 4,185,930, Cl. 400-320.000.

Aiga, Makoto: *See*—
Hirai, Yutaka; Miyate, Katsuharu; and Aiga, Makoto, 4,186,269, Cl. 560-25.000.

Aign, Volker; Schulze, Hans; Bremer, Fritz; Hornle, Reinhold; Wolf, Karlheinz; Berlenbach, Wilhelm; and Rasche, Peter, to Bayer Aktiengesellschaft. Aqueous dyestuff dispersions. 4,186,029, Cl. 106-308.00Q.

Air Industrie: *See*—
Lacchia, Adrien, 4,185,783, Cl. 239-704.000.

Air Preheater Company, Inc., The: *See*—
Stockman, Richard F., 4,185,687, Cl. 165-8.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Yamaguchi, Hiroji; Kato, Kikuo; and Kagata, Tooru, 4,185,727, Cl. 192-89.00B.

Ajinomoto Company, Incorporated: *See*—
Gomi, Teruo; Hisa, Yuji; and Soeda, Takahiko, 4,186,218, Cl. 426-598.000.
Yamazaki, Akihiro; Morisawa, Hirokazu; Oda, Yoshio; and Uchida, Keiichi, 4,186,266, Cl. 544-313.000.

Akademia Gorniczo-Hunicza im, Stanislawa Staszica: *See*—
Pawlik, Kazimierz; Janikowska-Pawlik, Jadwiga; and Siedlar, Adam, 4,185,708, Cl. 175-410.000.

Akeret, Rudolf, to Swiss Aluminium Ltd. Method of manufacturing aluminum alloy sheets containing magnesium and zinc. 4,186,034, Cl. 148-2.000.

Akiyama, Kenzo; and Ogihara, Masaru, to Tomy Kogyo Co., Inc. Toy musical instrument. 4,185,533, Cl. 84-83.000.

Akiyama, Shinichi: *See*—
Yamamoto, Haruhisa; and Akiyama, Shinichi, 4,186,152, Cl. 260-604.00R.

Akzona Incorporated: *See*—
Zeelen, Filippus J.; and Groen, Marinus B., 4,186,142, Cl. 260-397.500.

Albers, Teo, Sr. Cattle stanchion apparatus. 4,185,592, Cl. 119-148.000.

Albert Einstein College of Medicine of Yeshiva University: *See*—
Gabbay, Shlomo; and Frater, Robert, 4,185,636, Cl. 128-334.00R.

Albertson, Clarence E.; Nichols, George M.; and Rasmussen, John N., to Borg-Warner Corporation. Boiling heat transfer surface, method of preparing same and method of boiling. 4,186,063, Cl. 204-29.000.

Alfa-Laval S.A.: *See*—
Jevakohoff, Igor, 4,185,669, Cl. 141-59.000.

Alfranseder, Josef: *See*—
Rebsdat, Siegfried; Mayer, Sigmund; Alfranseder, Josef; and Riedl, Josef, 4,186,106, Cl. 252-414.000.

All Services Enterprises, Inc.: *See*—
Henschel, Arthur O., Jr.; and McCracken, Lurin K., 4,186,099, Cl. 210-457.000.

Allanic, Jacques: *See*—
Marie, Georges R. P.; Allanic, Jacques; and Peltier, Yves J., 4,185,889, Cl. 350-96.320.

Allen, Clifford H. Packing gland for pump shaft seal. 4,185,839, Cl. 277-105.000.

Allen, Samuel H. Adjustable shuffleboard cue head having swivel runners. 4,185,827, Cl. 273-129.00B.

Allied Chemical Corporation: *See*—
Gilman, John J., 4,186,245, Cl. 428-635.000.

Allis-Chalmers Corporation: *See*—
Berg, David A., 4,185,697, Cl. 172-10.000.
Schmidt, William M.; Thorwaldsen, Stanley E.; McElroy, David C.; and Miggels, Stephen G., 4,185,867, Cl. 296-187.000.

Alps Electric Co., Ltd.: *See*—
Matsuo, Katsuyuki, 4,186,290, Cl. 200-159.00A.

Alsina, Pierre A., to SpinOptic, Inc. Front wheel mirror mounting device alignment apparatus. 4,185,917, Cl. 356-155.000.

Altmayer, John, to Hustler, Inc. Citizens band mobile antenna mounting structure. 4,186,401, Cl. 343-715.000.

Alving, Carl R.: *See*—
Steck, Edgar A.; and Alving, Carl R., 4,186,183, Cl. 424-38.000.

Alvis, Robert L., to Medical Aids Research Foundation. Movable toilet seat assembly. 4,185,335, Cl. 4-251.600.

Alza Corporation: *See*—
Capozza, Richard C., 4,186,185, Cl. 424-19.000.
Zaffaroni, Alejandro, 4,186,184, Cl. 424-14.000.

Amata, Mario A.: *See*—
Gonzalez, John; Young, Ronald F.; and Amata, Mario A., 4,186,293, Cl. 219-146.240.

Amaury, Robert: *See*—
Guyot, Pierre; Delfau, Paul; and Amaury, Robert, 4,186,404, Cl. 346-29.000.

Ameco Corporation: *See*—
Hautau, Charles F., 4,185,943, Cl. 408-46.000.

American Can Company: *See*—
Smith, Jack L.; and Mitchell, Leon W., 4,186,225, Cl. 427-233.000.

American Cyanamid Company: *See*—
Gingras, Joel A., Sr.; Heffernan, William R.; Vega, Mary-Louise; and Beachem, Michael T., 4,186,426, Cl. 362-34.000.
Wang, Samuel S.; Smith, Eugene L., Jr.; and Huliganga, Ernie F., 4,186,083, Cl. 209-166.000.

American Flange & Manufacturing Co.: *See*—
Sciamonte, Philip A., 4,185,756, Cl. 222-83.500.

American Hoechst Corporation: *See*—
Clamkowski, Edward J.; and Fortunato, James M., 4,186,199, Cl. 424-232.000.

American Optical Corporation: *See*—
Buhler, Rato, 4,185,896, Cl. 351-29.000.
Rotenberg, Don H.; Cuffe, Patricia M.; and Laurin, Bernard L., 4,186,026, Cl. 106-287.140.

American Standard Inc.: *See*—
Briner, Clifton F.; and Hempel, Rodney A., 4,185,612, Cl. 126-122.000.

American Sunroof Corporation: *See*—
Kaltz, Milton C.; and Prechter, Heinz C., 4,185,868, Cl. 296-137.00B.

Ammann, Stephan K.; and Mohr, Siegfried H., to Quantor Corporation. Apparatus for recording multiple, superimposed, independent images on microfilm. 4,185,913, Cl. 355-43.000.

AMP Incorporated: *See*—
Hays, Kenneth S.; and Lawson, Gustaf R., 4,185,519, Cl. 74-577.00S.

Amstutz, Willis J. Rose and shrubbery trimmer. 4,185,379, Cl. 30-134.000.

Ancra Corporation: *See*—
Prete, Ernest, Jr.; and Clay, Herbert N., 4,185,360, Cl. 24-68.0CD.

Andersen Corporation: *See*—
Wilmes, Richard J., 4,185,416, Cl. 49-406.000.

Andersen, Henry K.; and Chipchase, Frank D., to International Multifoods Corporation. Cleaning apparatus for disc cutter. 4,185,528, Cl. 83-168.000.

Anderson, Bernard J., to General Electric Company. Fastening device with positive locking means. 4,185,937, Cl. 403-316.000.

Anderson, Clay H.: *See*—
Ewart, James M.; Anderson, Clay H.; and St. Jean, Gerard, 4,185,513, Cl. 74-425.000.

Anderson, Richard K.; and Rohrman, Frederick A., to United States of America, Navy. Sweeping acoustic mines. 4,185,554, Cl. 102-18.0MS.

Anderson, Wesley K., to General Electric Company. Prime mover and method of assembling a device thereto. 4,186,318, Cl. 310-68.00C.

Andress, Harry J.: *See*—
Schick, John W.; Davis, Robert H.; and Andress, Harry J., 4,185,485, Cl. 72-42.000.

Anisovich, Gennady A.: *See*—
Zabava, Jury G.; Kogan, Rem N.; Lurie, Dzhan A.; Surkov, Viktor G.; Bratslavskaya, Elvira A.; Barabash, Ivan M.; Rodnyanksy, Ilya G.; Maljukyavichjus, Antanas A.; Voitenko, Egor T.; Anisovich, Gennady A.; Bevza, Vladimir F.; Tutov, Vadim I.; Grinberg, Valentin A.; Marukovich, Evgeny I.; and Senkin, Nikolai A., 4,185,684, Cl. 164-263.000.

Antos, John M.: *See*—
Sargent, Frank T.; Antos, John M.; Henke, Arthur W.; Embach, James T.; Butler, Frederick A.; and Lindsay, Erin J., 4,185,337, Cl. 4-300.000.
Sargent, Frank T.; Henke, Arthur W.; Antos, John M.; and Cameron, John T., 4,185,340, Cl. 4-441.000.

Aoki, Eiichiro: *See*—
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Aoki, Eiichiro; and Yamaga, Eiichi, 4,185,532, Cl. 84-1.260.

Application Des Gaz: *See*—
Vache, Marcel; and Ferra, Antoine, 4,185,748, Cl. 220-8.000.

Areaux, Larry D.; and Halisek, Frank C., to Reclamet, Inc. Shiftable bottom wall for separator bowl and blade construction therefor. 4,186,096, Cl. 210-377.000.

Argus Chemical Corporation: *See*—
Kubota, Naohiro; Shibata, Toshihiro; and Sugibuchi, Kazuo, 4,186,151, Cl. 260-591.000.

Arimura, Yoshiaki, to Tokyo Shibaura Electric Co., Ltd. Apparatus for detecting the position of fine object. 4,186,412, Cl. 358-101.000.

Arita, Kazutoshi: *See*—
Taoka, Tadami; Nakajima, Fumio; Kawamura, Hisashki; Hirano, Yutaka; Maru, Kimio; Arita, Kazutoshi; and Yoshida, Hidemasa, 4,186,305, Cl. 250-311.000.

Armstrong, Dan H.; and Kamerer, Larry G. Liquid metering and mixing device. 4,185,653, Cl. 137-114.000.

Armstrong, Harris W.: *See*—
Deffeyes, Robert J.; and Armstrong, Harris W., 4,186,244, Cl. 428-570.000.

Armstrong, John L. Carpet cleaning. 4,186,030, Cl. 134-1.000.

Armstrong, John L.; and Tarkinson, Edward G. Dry cleaning carpeting. 4,186,031, Cl. 134-1.000.

Aro-Sac Inc.: *See*—
Saccoccio, Nazareno J., 4,185,471, Cl. 63-14.00C.

Aron, Gunter; and Hassis, Carl H., to United States of America, Army. "BZ" containing pyrotechnic compositions. 4,186,040, Cl. 149-19.400.

Artamonov, Viktor L.: *See*—
Medovar, Boris I.; Artamonov, Viktor L.; Bogachenko, Alexei G.; Shtanko, Jury P.; Bondarenko, Oleg P.; Eltsov, Konstantin S.; Stetsenko, Nikolai V.; Popov, Sergei S.; Kaganovsky, Gary P.; and Korotkov, Albert N., 4,185,683, Cl. 164-252.000.

Asahi Glass Company Limited: *See*—
Yamazaki, Akihiro; Morisawa, Hirokazu; Oda, Yoshio; and Uchida, Keiichi, 4,186,266, Cl. 544-313.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Kitamura, Taketsugu; and Takagi, Hitoshi, 4,186,176, Cl. 423-235.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Ogawa, Ryota; Okudaira, Sadao; Itoh, Takayuki; and Tachihara, Satoru, 4,185,893, Cl. 350-184.000.

Asher, Nathan F. Device to aid in detecting dangerous fumes in a power boat. 4,185,579, Cl. 114-211.000.

Ashland Oil, Inc.: *See*—
Carlos, Donald D., 4,186,077, Cl. 208-3.000.

Astbury, James H.; and Broadbent, Barrie, to CIBA-GEIGY Corporation. Image producing system. 4,186,243, Cl. 428-537.000.

Astra Lakemedel Aktiebolag: *See*—
Carlsson, Per A. E.; Carnmalm, Bernt S. E.; Ross, Vante B.; and Ulff, Carl B. J., 4,186,202, Cl. 424-263.000.

Atherton, Robert A.; Berchtold, Donald R.; and Easterling, Gene B., to Caterpillar Tractor Co. Circle mounting and circle assembly for a motor grader. 4,185,700, Cl. 172-796.000.

Atomic Products Corporation: *See*—
Reiss, James M., 4,185,619, Cl. 128-1.100.

Atsukawa, Masumi; Nishimoto, Yoshihiko; Yokoyama, Naruo; and Sera, Toshikuni, to Mitsubishi Jukogyo Kabushiki Kaisha. Catalyst for selectively reducing nitrogen oxides from oxygen-containing exhaust gases. 4,186,109, Cl. 252-440.000.

Attridge, John T.; and Barnstead, John, to Wylain, Inc. Connector for terminating the end of a sheathed heating element. 4,186,369, Cl. 338-274.000.

Attwell, Michael C.: *See*—
Ziegler, Peter; Attwell, Michael C.; Massiah, Thomas F.; and Vergottini, Roberto A., 4,186,143, Cl. 260-397.100.

Audi Nsu Auto Union Aktiengesellschaft: *See*—
Scholz, Rainer, 4,186,172, Cl. 422-180.000.

Audibert, Francoise: *See*—
Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,186,194, Cl. 424-89.000.

Aultz, Thomas R.: *See*—
Woods, Thomas H.; and Aultz, Thomas R., 4,185,646, Cl. 133-4.00R.

Aurin, Friedrich, to Carl Zeiss Stiftung. Apparatus for the adjustment of two intersecting optical axes. 4,185,892, Cl. 350-171.000.

Aurousseau, Michel: *See*—
Robba, Max F.; and Aurousseau, Michel, 4,186,136, Cl. 544-146.000.

B & D Trailer Company Limited: *See*—
Brown, Bruce R., 4,185,823, Cl. 273-95.00R.

B. F. Goodrich Company, The: *See*—
Brodine, Walter E.; and Gajdos, Leslie B., 4,185,584, Cl. 116-272.000.
Bush, Charles N.; and Mikofalvy, Bela K., 4,186,259, Cl. 526-74.000.
Powell, Joe A.; Messerly, James W.; and Shippy, Ronald L., 4,186,042, Cl. 156-115.000.

B. H. Bunn Company: *See*—
Pierce, Paul, Jr.; and Beedy, Robert G., 4,185,548, Cl. 100-27.000.

Babunovic, Momir, to Barry-Wehmiller Company. Container cleaning machine. 4,185,647, Cl. 134-60.000.

Bache, John K.; Sanderson, Albert M.; and Pearson, Arthur, to George Salter & Company, Limited. Method of stabilizing springs. 4,186,039, Cl. 148-128.000.

Baculo, Umberto A. Lock and release form clamp. 4,185,804, Cl. 249-20.000.

Baechtold, Werner; and Gueret, Pierre, to International Business Machines Corporation. Magnetic vortex generator with a vortex pool and single vortex transfer. 4,186,441, Cl. 365-160.000.

Baggaley, Keith H.: *See*—
Nunn, Barbara; and Baggaley, Keith H., 4,186,203, Cl. 424-267.000.

Bahr, Dietrich J.; and Burckardt, Karl H., to International Business Machines Corporation. Multiple-electrode print head for electroerosion printers. 4,186,406, Cl. 346-163.000.

Baier, Erich; and Hahn, Hans, to Siemens Aktiengesellschaft. Support assembly for components of electrostatic copiers. 4,185,907, Cl. 355-3.00R.

Baird, Billy C.: *See*—
Baird, William R.; Sutton, Kenneth O.; and Baird, Billy C., 4,186,055, Cl. 202-248.000.

Baird, William R.; Sutton, Kenneth O.; and Baird, Billy C., to Saturn Machine & Welding Co., Inc. Coke oven door. 4,186,055, Cl. 202-248.000.

Baker, Donald E.: *See*—
Bouette, David W.; Baker, Donald E.; and Cartwright, Fred, 4,185,923, Cl. 366-10.000.

Baker International Corporation: *See*—
Kinney, Charles W., 4,185,690, Cl. 166-183.000.

Baker Perkins Holdings Limited: *See*—
Johnson, Reginald F.; and Cawte, Ronald, 4,185,442, Cl. 53-168.000.

Baker, William, III; and Vincent, Joe W., to Smith International, Inc. Rock bit with cavitating jet nozzles. 4,185,706, Cl. 175-340.000.

Balcke-Durr Aktiengesellschaft: *See*—
Adrian, Fritz, 4,185,346, Cl. 9-1.700.

Baldwin, Samuel L., to General Electric Company. Luminaire. 4,186,433, Cl. 362-263.000.

Ballard, James R., to Western Electric Company. End-of-keying control circuit. 4,186,278, Cl. 179-18.0ET.

Balster, Hugo, to Readymix Cement Engineering GmbH & Co. KG. Gas permeable structural part. 4,185,956, Cl. 432-258.000.

Bangs, Sonia W.: *See*—
Chamberlin, Thomas A.; and Bangs, Sonia W., 4,186,191, Cl. 424-78.000.
Barabash, Ivan M.: *See*—
Zabava, Jury G.; Kogan, Rem N.; Lurie, Dzhan A.; Surkov, Viktor G.; Bratslavskaya, Elvira A.; Barabash, Ivan M.; Rodnyanksy, Ilya G.; Maljukyavichjus, Antanas A.; Voitenko, Egor T.; Anisovich, Gennady A.; Bevza, Vladimir F.; Tutov, Vadim I.; Grinberg, Valentin A.; Marukovich, Evgeny I.; and Senkin, Nikolai A., 4,185,684, Cl. 164-263.000.
Barabino, William A., to Safety Research & Engineering Corporation. Method and apparatus for monitoring tire pressure. 4,186,377, Cl. 340-58.000.
Barakauskas, Edward J., to United States of America, Navy. Simplified air system for underwater rocket launching. 4,185,538, Cl. 89-1.810.
Barbe, Gerard; and Habault, Robert, to Rhone-Poulenc-Textile. Process for producing bicomponent filaments with special cross-section. 4,186,168, Cl. 264-168.000.
Bardsley, Harold B.; and Priestley, Harry, to Spencer Wright Industries, Inc. Cutting instrumentalities for tufting machines. 4,185,568, Cl. 112-79.00R.
Barinek, Robert F., to Zenith Radio Corporation. Self-contained adjustable yoke mounting system. 4,186,414, Cl. 358-248.000.
Barnett, Melvin L. Beading installation tool. 4,185,371, Cl. 29-235.000.
Barnish, Ian T.; Cross, Peter E.; Danilewicz, John C.; and Morville, Malcolm, to Pfizer Inc. Method of treatment with glycinamides. 4,186,210, Cl. 424-324.000.
Barnstead, John: *See*—
Attridge, John T.; and Barnstead, John, 4,186,369, Cl. 338-274.000.
Barry-Wehmiller Company: *See*—
Babunovic, Momir, 4,185,647, Cl. 134-60.000.
Barth, Gunter; and von Langsdorff, Fritz. Ground covering slab. 4,185,939, Cl. 404-38.000.
BASF Aktiengesellschaft: *See*—
Kempter, Fritz E.; and Boehlke, Klaus, 4,186,075, Cl. 204-294.000.
Basile, Pedro. Pressure cooker lid fastening means. 4,185,752, Cl. 220-314.000.
Basire, Alain; Roche, Pierre; and Thenard, Jean, to Commissariat a l'Energie Atomique. Automatic focus control for a microscope. 4,186,301, Cl. 250-204.000.
Batchelor, Phillip J., to Xerox Corporation. Reproduction machine with different operating programs. 4,186,299, Cl. 235-304.100.
Batogowski, Joseph H.: *See*—
Gall, John C.; Batogowski, Joseph H.; and Chamberlain, Albert F., 4,185,400, Cl. 35-5.000.
Bauer, Peter, to Bowles Fluidics Corporation. Fluidic spray device of simple construction. 4,185,777, Cl. 239-394.000.
Baumgartner Papiers S.A.: *See*—
Boegli, Serge; and Lebet, Jean-Pierre, 4,185,645, Cl. 131-261.00R.
Baxter Travenol Laboratories, Inc.: *See*—
Cullis, Herbert M.; DeVries, James H.; Lohr, David A.; Rodriquez, Rodolfo R.; and Uffer, Michael B., 4,185,629, Cl. 128-214.00R.
Zissimopoulos, Nick, 4,185,759, Cl. 222-450.000.
Bayer Aktiengesellschaft: *See*—
Aign, Volker; Schulze, Hans; Bremer, Fritz; Hornle, Reinhold; Wolf, Karlheinz; Berlenbach, Wilhelm; and Rasche, Peter, 4,186,029, Cl. 106-308.00Q.
Binsack, Rudolf; Reese, Eckart; Tresper, Erhard; and Wank, Joachim, 4,186,154, Cl. 525-461.000.
Blahak, Johannes; Gipp, Roland; Wagner, Kuno; Muller, Erwin; Mazanek, Jan; and Haas, Peter, 4,186,257, Cl. 521-159.000.
Dhein, Rolf; Fleiter, Lothar; and Beer, Wolfgang, 4,186,116, Cl. 260-23.0AR.
Reischl, Artur; Wenzel, Wolfgang; and Dieterich, Dieter, 4,186,118, Cl. 260-29.2TN.
Sachs, Hermann W.; Marek, Peter; and Dorner, Florian, 4,185,755, Cl. 222-43.000.
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,185,991, Cl. 71-92.000.
Weissel, Oskar, 4,186,145, Cl. 260-563.00D.
Woditsch, Peter; Teichmann, Gunther; Linde, Gunter; Lailach, Gunter; and Rodi, Fritz, 4,186,028, Cl. 106-300.000.
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., to Rohm and Haas Company. Herbicidal 4-trifluoromethyl-4'nitrodiphenyl ethers. 4,185,995, Cl. 71-124.000.
Bazan, John A., to United States of America, Environmental Protection Agency. Material transfer system. 4,185,942, Cl. 406-85.000.
BBA Group Limited: *See*—
Cawthra, Christopher; and Brooke, Richard K., 4,185,718, Cl. 156-258.000.
Beachem, Michael T.: *See*—
Gingras, Joel A., Sr.; Heffernan, William R.; Vega, Mary-Louise; and Beachem, Michael T., 4,186,426, Cl. 362-34.000.
Beals, Charles E., to Caterpillar Tractor Co. Hydraulic control system for a hydrostatic-mechanical transmission. 4,185,521, Cl. 74-865.000.
Bean, Lloyd F.: *See*—
Miller, Roger L.; and Bean, Lloyd F., 4,185,916, Cl. 355-3.0DD.
Bearcroft, Kenneth E.: *See*—
Watson, Christopher A.; Bearcroft, Kenneth E.; Bronzite, Michael; and Palmer, Alan G., 4,185,498, Cl. 73-194.00A.
Beaucamp, Klaus: *See*—
Roder, Albert; Mollering, Hans; Gruber, Wolfgang; Beaucamp, Klaus; Seidel, Hans; Stahl, Peter; and von Hoerschelmann, Detlef, 4,186,052, Cl. 435-28.000.
Beck, Gunther: *See*—
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,185,991, Cl. 71-92.000.
Beckmann, Klaus, to Gewerkschaft Eisenhutte Westfalia. Longwall installation with carrier for water and electric supply and propulsion rock. 4,185,874, Cl. 299-32.000.
Beecham Group Limited: *See*—
Nunn, Barbara; and Baggaley, Keith H., 4,186,203, Cl. 424-267.000.
Palmer, Geoffrey H., 4,186,206, Cl. 424-283.000.
Beedy, Robert G.: *See*—
Pierce, Paul, Jr.; and Beedy, Robert G., 4,185,548, Cl. 100-27.000.
Beer, Wolfgang: *See*—
Dhein, Rolf; Fleiter, Lothar; and Beer, Wolfgang, 4,186,116, Cl. 260-23.0AR.
Behr, Karl-Gunter, to Minox GmbH. Reading device. 4,185,901, Cl. 353-27.00R.
Beitzel, Stuart W.: *See*—
Harter, Joseph W., III; and Beitzel, Stuart W., 4,186,070, Cl. 204-176.000.
Bell, David G.; and Gibson, Keith R., to English Clays Lovering Pochin & Company Limited. Processing of kaolinitic clays at high solids. 4,186,027, Cl. 106-288.00B.
Bell & Howell Company: *See*—
Rabindran, K. George; and Stites, David G., 4,185,900, Cl. 353-26.00R.
Bell Telephone Laboratories, Incorporated: *See*—
Cho, Alfred Y.; Di Lorenzo, James V.; and Niehaus, William C., 4,186,410, Cl. 357-67.000.
Belrose, Frank R. Broadcast sprayer. 4,185,782, Cl. 239-663.000.
Bender, Joseph M. Radiant therapeutic heater. 4,186,294, Cl. 219-527.000.
Bender, Paul E., to SmithKline Corporation. 2,3-Di(4-substituted phenyl)-6,7-dihydro-5H-pyrrolo[1,2-a]imidazoles. 4,186,205, Cl. 424-273.00R.
Bendix Autolite Corporation: *See*—
Romine, Donald J.; Davis, Donald C.; Woodruff, Phillip R.; Young, Ching T.; Bode, James D.; and Tien, Tseng Y., 4,186,071, Cl. 204-195.00S.
Bendix Corporation, The: *See*—
Wang, Shou-I; and Hansen, Charles M., Jr., 4,186,391, Cl. 340-645.000.
Watson, Edwin B., 4,185,779, Cl. 239-533.300.
Benkoe, Elisabeth: *See*—
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; Benkoe, Elissbeth, executrix; Dantzer, Elonne; La Dow, William R.; Ginn, Wayne M.; and Dyson, L. Ray, 4,185,413, Cl. 46-118.000.
Benkoe, Elisabeth, executrix: *See*—
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; Benkoe, Elisabeth, executrix; Dantzer, Elonne; La Dow, William R.; Ginn, Wayne M.; and Dyson, L. Ray, 4,185,413, Cl. 46-118.000.
Benkoe, Erwin, deceased: *See*—
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; Benkoe, Elisabeth, executrix; Dantzer, Elonne; La Dow, William R.; Ginn, Wayne M.; and Dyson, L. Ray, 4,185,413, Cl. 46-118.000.
Bennett, Melvin T.: *See*—
Edwin, Allan I.; and Bennett, Melvin T., 4,186,380, Cl. 340-147.0SC.
Benson, Paul H.; Kingdom-Hockings, Michael L.; Middleton, Brian H.; Pinnell, Martin C.; Robinson, Thomas E.; Sheeler, Richard E.; and Simmons, John, to International Business Machines Corporation. Interactive enquiry system. 4,186,438, Cl. 364-200.000.
Benton, Ronald, to Honeywell Inc. Expanded time constant condition control system using a unidirectional counter with multiple channels. 4,186,315, Cl. 307-117.000.
Berchtold, Donald R.: *See*—
Atherton, Robert A.; Berchtold, Donald R.; and Easterling, Gene B., 4,185,700, Cl. 172-796.000.
Berg, David A., to Allis-Chalmers Corporation. Torsion bar draft load limit and preload adjuster. 4,185,697, Cl. 172-10.000.
Bergstrom, Rolf; and Svensson, Stig, to Bulten-Kanthal AB. Link stud inserter. 4,185,454, Cl. 59-1.000.
Bergthaller, Peter; von Bonin, Wulf; Helling, Gunter; and Marx, Paul, to Agfa-Gevaert Aktiengesellschaft. Light sensitive photographic material containing a mordant layer. 4,186,014, Cl. 430-213.000.
Berkley & Company, Inc.: *See*—
Mize, Charles J.; and Rumbaugh, James T., 4,186,239, Cl. 428-399.000.
Berkman, Samuel, to BST Associates. Lettering template. 4,185,392, Cl. 33-174.00B.
Berlenbach, Wilhelm: *See*—
Aign, Volker; Schulze, Hans; Bremer, Fritz; Hornle, Reinhold; Wolf, Karlheinz; Berlenbach, Wilhelm; and Rasche, Peter, 4,186,029, Cl. 106-308.00Q.
Berman, Oded. Mechanical quiz game. 4,185,820, Cl. 273-1.00E.
Bernat, Georg, to ITT Industries, Inc. Single-handle mixing faucet. 4,185,659, Cl. 137-625.170.
Berner, Charles R. Portable canine toilet. 4,185,861, Cl. 294-19.00R.
Bernstein, Morton J. Sit-up exercise apparatus. 4,185,816, Cl. 272-93.000.
Bertea Corporation: *See*—
York, Ray A.; and Simmons, William D., 4,185,542, Cl. 92-166.000.
Besson, Francis, to Girard-Perregaux S.A. Electric rotary stepping motor. 4,186,322, Cl. 310-194.000.
Bethlehem Steel Corporation: *See*—
Fegan, Lloyd V., r., 4,185,746, Cl. 209-691.000.

Betlinski, Glenn M., to FMC Corporation. Overload safety fastener. 4,185,516, Cl. 74-501.50R.

Betsudan, Shinichi: *See—*
Mizusawa, Motoo; Kinoshita, Chikao; Betsudan, Shinichi; and Sato, Sigeru, 4,186,402, Cl. 343-781.0CA.

Bevza, Vladimir F.: *See—*
Zabava, Jury G.; Kogan, Rem N.; Lurie, Dzhan A.; Surkov, Viktor G.; Bratslavskaya, Elvira A.; Barabash, Ivan M.; Rodnyanksy, Ilya G.; Maljukyavichjus, Antanas A.; Voitenko, Egor T.; Anisovich, Gennady A.; Bevza, Vladimir F.; Tutov, Vadim I.; Grinberg, Valentin A.; Marukovich, Evgeny I.; and Senkin, Nikolai A., 4,185,684, Cl. 164-263.000.

Beyer, Horst; Buran, Ulrich; and Neuhauser, Hans-Joachim, to Goetze AG. Friction wear experiencing machine part having a coating on its sliding surface. 4,185,843, Cl. 277-224.000.

Bierlein, John W. Coupling apparatus. 4,185,935, Cl. 403-14.000.

BIG Spielwarenfabrik Dipl.-Ing. Ernst A. Bettag: *See—*
Rahmstorf, Dietmar, 4,185,412, Cl. 46-116.000.

Billings Energy Corporation: *See—*
Woolley, Ronald L., 4,185,979, Cl. 62-48.000.

Binsack, Rudolf; Reese, Eckart; Tresper, Erhard; and Wank, Joachim, to Bayer Aktiengesellschaft. Polycarbonate mixtures which can be processed as thermoplastics. 4,186,154, Cl. 525-461.000.

Bischlipp, Klaus; Weitzel, Werner; and Hueck, Walter, to Hueck, Eduard. Connecting element and a method of manufacture the same. 4,185,439, Cl. 52-731.000.

Bishop, Elizabeth A.: *See—*
Lustig, Leopold P.; and Bishop, Elizabeth A., 4,185,384, Cl. 433-70.000.

Bissell, Inc.: *See—*
Yonkers, Robert A.; and Mattano, Leonard A., 4,185,932, Cl. 401-21.000.

Black, Alister, to Universal Development Company Limited. Process and apparatus for continuously prestressing concrete products. 4,186,169, Cl. 264-228.000.

Black, Odell D. Rough terrain creeper. 4,185,846, Cl. 280-32.600.

Blackburn, James R.; and Smith, Dudley C., to John E. Mitchell Company. Torque-transmitting, torque-sensing system. 4,185,511, Cl. 74-242.14R.

Blahak, Johannes; Gipp, Roland; Wagner, Kuno; Muller, Erwin; Mazanek, Jan; and Haas, Peter, to Bayer Aktiengesellschaft. Process for the preparation of new segmented polyurethane resins derived from block copolymers being linked together through ester and/or urethane and/or urea groups. 4,186,257, Cl. 521-159.000.

Blake, Colin C.; and Payne, Ivan C., to Ciba-Geigy Aktiengesellschaft. Electrolytic recovery of silver from photographic bleach-fix baths. 4,186,067, Cl. 204-109.000.

Blanc, Pierre; and Perrot, Robert, to Societe des Acieries de Paris et D'Outreau. Method of manufacturing 12 to 14% Mn steel components with weldable end pieces. 4,185,773, Cl. 238-150.000.

Blanco, Francisco. Combination rake and trash pick-up tool. 4,185,448, Cl. 56-400.120.

Blattermann, Karl-Gunther. Curve conveyor belt and method and apparatus for producing the same. 4,185,737, Cl. 198-831.000.

Blinkov, Vadim A.: *See—*
Ordanian, Sergei S.; Lysanov, Vladislav S.; Digonsky, Viktor V.; Blinkov, Vadim A.; Pekelis, Ljubov A.; Denisova, Vera I.; Unrod, Vladimir I.; Sinelnikov, Sergei V.; and Chestnokova, Marina P., 4,186,022, Cl. 106-43.000.

Bloom, Stanley M.: *See—*
Land, Edwin H.; and Bloom, Stanley M., 4,186,013, Cl. 430-228.000.
Land, Edwin H.; and Bloom, Stanley M., 4,186,015, Cl. 430-231.000.

Blum, Jacques M.; and Ventre, Edmond, to Electricite de France (Service National) & Pechiney Ugine-Kuhlman. Heat exchanger integrated into the main vessel of a molten combustible salt reactor. 4,186,049, Cl. 176-38.000.

Blumenthal, Robert N.; and Melville, Andreas T. Hot gas measuring device. 4,186,072, Cl. 204-195.00S.

Bobak, Tadeusz; and Bobak, Tadeusz C. Automatic display system and process. 4,186,394, Cl. 340-764.000.

Bobak, Tadeusz C.: *See—*
Bobak, Tadeusz; and Bobak, Tadeusz C., 4,186,394, Cl. 340-764.000.

Bochumer Eisenhutte Heintzmann GmbH & Co.: *See—*
Bohnes, Karlheinz; and Guse, Kuno, 4,185,873, Cl. 299-31.000.

Bode, James D.: *See—*
Romine, Donald J.; Davis, Donald C.; Woodruff, Phillip R.; Young, Ching T.; Bode, James D.; and Tien, Tseng Y., 4,186,071, Cl. 204-195.00S.

Boegli, Serge; and Lebet, Jean-Pierre, to F. J. Burrus & Cie; and Baumgartner Papiers S.A. Production of cigarette filter units. 4,185,645, Cl. 131-261.00R.

Boehlke, Klaus: *See—*
Kempter, Fritz E.; and Boehlke, Klaus, 4,186,075, Cl. 204-294.000.

Boehringer Mannheim GmbH: *See—*
Roder, Albert; Mollering, Hans; Gruber, Wolfgang; Beaucamp, Klaus; Seidel, Hans; Stahl, Peter; and von Hoerschelmann, Detlef, 4,186,052, Cl. 435-28.000.

Boeing Commercial Airplane Company: *See—*
Bradley, Robert J.; and Hainsworth, William A., 4,186,044, Cl. 156-273.000.
Richards, Edward W., Jr., 4,185,799, Cl. 244-118.50R.

Boeing Company, The: *See—*
LaConte, Richard J., 4,185,415, Cl. 49-248.000.

Boeniger, Regula: *See—*
Krasnobajew, Victor; and Boeniger, Regula, 4,186,053, Cl. 435-180.000.

Bogachenko, Alexei G.: *See—*
Medovar, Boris I.; Artamonov, Viktor L.; Bogachenko, Alexei G.; Shtanko, Jury P.; Bondarenko, Oleg P.; Eltsov, Konstantin S.; Stetsenko, Nikolai V.; Popov, Sergei S.; Kaganovsky, Gary P.; and Korotkov, Albert N., 4,185,683, Cl. 164-252.000.

Bohnes, Karlheinz; and Guse, Kuno, to Bochumer Eisenhutte Heintzmann GmbH & Co. Machine for mechanically advancing clean cut underground mining galleries of various profiles. 4,185,873, Cl. 299-31.000.

Bohringer, Walter, to RCA Corporation. Voltage regulator for a television deflection circuit. 4,186,330, Cl. 315-411.000.

Boie, Immo: *See—*
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Albertson, Clarence E.; Nichols, George M.; and Rasmussen, John N., 4,186,063, Cl. 204-29.000.
Gatewood, Sidney U., 4,185,728, Cl. 192-106.200.
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Dodson, George B., 4,186,273, Cl. 179-1.00G.
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Bauer, Peter, 4,185,777, Cl. 239-394.000.

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Forrest, John W., 4,186,386, Cl. 340-366.00R.

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Lin, Chi-Hung; and Pansing, William F., deceased, 4,186,082, Cl. 208-310.00Z.

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Brazier, Alan J., to Vax Appliances Limited. Apparatus for cleaning floors, carpets and the like. 4,185,354, Cl. 15-321.000.

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Brentham, Jerry D. Fluid resistance type leg exerciser. 4,185,818, Cl. 272-130.000.

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Motomura, Kenichi; Yahagi, Mitsuhisa; and Sogi, Toshiyuki, 4,185,677, Cl. 152-362.00R.

Briner, Clifton F.; and Hempel, Rodney A., to American Standard Inc. Heat circulating fireplace. 4,185,612, Cl. 126-122.000.

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Hewitt, Malcolm, 4,185,952, Cl. 425-149.000.

British Steel Corporation: *See*—
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Watson, Christopher A.; Bearcroft, Kenneth E.; Bronzite, Michael; and Palmer, Alan G., 4,185,498, Cl. 73-194.00A.

Brooke, Richard K.: *See*—
Cawthra, Christopher; and Brooke, Richard K., 4,185,718, Cl. 156-258.000.

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Brown, Bruce R., to B & D Trailer Company Limited. Bicycle game device and method of playing games therewith. 4,185,823, Cl. 273-95.00R.

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Sherlock, Hugh P.; Ewry, Edwin E.; Sandvoss, Werner E.; Ciupke, Werner W.; Brown, Glenn E.; and Link, William T., 4,185,899, Cl. 352-72.000.

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Brownlee, Robert O. Faced building unit. 4,185,431, Cl. 52-309.170.

Bruce, Joseph R.: *See*—
Henneman, Richard C.; Burdon, Kenneth A.; and Bruce, Joseph R., 4,185,520, Cl. 74-750.00R.

Brundage, Ben W. External swivel joint seal. 4,185,841, Cl. 277-167.500.

Bruner, James D., to Sandoz, Inc. Pressure indicators for inflatable cuff-type catheters. 4,185,638, Cl. 128-349.00B.

Bryant, Charles P., to Lubrizol Corporation, The. Hydroxyalkyl hydroxy-aromatic condensation products as fuel and lubricant additives. 4,186,139, Cl. 260-346.740.

Bryant, Clyde C. Distress gas generating signal balloon apparatus. 4,185,582, Cl. 116-210.000.

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Berkman, Samuel, 4,185,392, Cl. 33-174.00B.

Buchel, Johannes A., to PepsiCo. Inc. Beverage carbonation arrangement. 4,186,215, Cl. 426-86.000.

Buchmann, Albert H.; Cochran, Thomas J.; Ficker, Walter W., Stricker, Alfred A.; and von Kaenel, Walter, to International Business Machines Corporation. Pick up and placement head for green sheet and spacer. 4,185,814, Cl. 271-108.000.

Buckner, Carrol E., to Smoky Mountain Enterprises, Inc. Forced air channel baffles. 4,185,610, Cl. 126-121.000.

Budzyn, Boleslaw L., to Weldotron Corporation. Bag sealing machine. 4,185,443, Cl. 53-550.000.

Bugaut, Andree; Grollier, Jean-Francois; and Vandenboosche, Jean-Jacques. Compositions based on direct dyestuffs containing a 2,5-dihydroxyphenylcarboxylic acid or a salt thereof. 4,185,958, Cl. 8-10.100.

Buhler, Rato, to American Optical Corporation. Refractor cross-cylinder apparatus. 4,185,896, Cl. 351-29.000.

Bulang, Wolfgang, to Maschinenfabrik Augsburg-Nuernberg AG. Process and plant for recovering water from moist gas. 4,185,969, Cl. 55-31.000.

Bulger, Frederick J., to Honeywell Inc. Master slave steering control. 4,185,712, Cl. 180-131.000.

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Bullard, Gerald D. Method and apparatus for borehole perforating. 4,185,702, Cl. 175-4.540.

Bulteau, Gerard: *See*—
Thominet, Michel; Bulteau, Gerard; Acher, Jacques; and Colligon, Claude, 4,186,135, Cl. 260-326.340.

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Bergstrom, Rolf; and Svensson, Stig, 4,185,454, Cl. 59-1.000.

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Beyer, Horst; Buran, Ulrich; and Neuhauser, Hans-Joachim, 4,185,843, Cl. 277-224.000.

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Bahr, Dietrich J.; and Burckardt, Karl H., 4,186,406, Cl. 346-163.000.

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Burford, John R.; and Slater, Paul, to Delta Plastics Limited. Animal ear tag applicator. 4,185,635, Cl. 128-330.000.

Burke Company, The: *See*—
Ewing, Josh, 4,185,805, Cl. 249-210.000.

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Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.

Burns, Robert V., to GTE Automatic Electric Laboratories Incorporated. Initial rate override circuit. 4,186,275, Cl. 179-6.30R.

Burris, Lee R.: *See*—
Howerton, Anderson W.; and Burris, Lee R., 4,185,447, Cl. 56-376.000.

Burroughs Corporation: *See*—
Holz, George E., 4,186,392, Cl. 340-712.000.

Burroughs, Wise; and Trenkle, Allen H., to Iowa State University Research Foundation, Inc. Method of feeding cattle for maximized protein utilization. 4,186,213, Cl. 426-2.000.

Buscher, Enno; and Vinzens, Kurt, to Interatom, Internationale Atomreaktorbau GmbH. Nuclear energy plant with improved device for removing after-heat and emergency heat. 4,186,051, Cl. 176-65.000.

Buser, Hansueli, to Ciba-Geigy Corporation. Sample introduction system. 4,185,500, Cl. 73-422.0GC.

Bush, Charles N.; and Mikofalvy, Bela K., to B. F. Goodrich Company, The. Process for producing homopolymers or copolymers of vinyl or vinylidene halides by emulsion polymerization. 4,186,259, Cl. 526-74.000.

Busse, Peter, to Richard Heinze Co. Furniture hinge component. 4,185,357, Cl. 16-130.000.

Butler, Frederick A.: *See*—
Sargent, Frank T.; Antos, John M.; Henke, Arthur W.; Embach, James T.; Butler, Frederick A.; and Lindsay, Erin J., 4,185,337, Cl. 4-300.000.

Butler, William S.: *See*—
Farris, Richard C.; and Butler, William S., 4,185,719, Cl. 188-33.000.

Butte, Walter A., Jr.; and Murtaugh, William J., to Suntech, Inc. Hydrogenation of aromatic nitriles to primary amines. 4,186,146, Cl. 260-570.50P.

Butts, Michelle J.: *See*—
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.

B.V. Machinefabriek v/h Pannevis & Zh.: *See*—
van Oosten, Jacob, 4,186,090, Cl. 210-77.000.

C. H. Anderson and Associates Ltd.: *See*—
Ewart, James M.; Anderson, Clay H.; and St. Jean, Gerard, 4,185,513, Cl. 74-425.000.

C. van der Lely N. V.: *See*—
van der Lely, Ary; and Kuipers, Arie, 4,185,477, Cl. 64-28.00R.

Cadau, Francesco: *See*—
Moruzzi, Pietro; and Cadau, Francesco, 4,185,450, Cl. 57-247.000.

Cahill Enterprises, Inc.: *See*—
Cahill, Harold J., 4,186,335, Cl. 320-3.000.

Cahill, Harold J., to Cahill Enterprises, Inc. Hearing aid battery recharging apparatus. 4,186,335, Cl. 320-3.000.

Cailloux, Michel, to CGEE Alsthom. Device for controlling a Graetz rectifier bridge. 4,186,435, Cl. 363-37.000.

California Institute of Technology: *See*—
Cuk, Slobodan M., 4,186,437, Cl. 363-65.000.
Jahnsen, Vilhelm J.; and Campen, Charles F., Jr., 4,186,187, Cl. 422-64.000.

Calleson, Donald A., to Liggett Group Inc. Device for measuring the circumference of a cylindrical rod. 4,185,393, Cl. 33-178.00R.

Camardella, Giuseppe, to Tekma Kinomat S.p.A. Structure of a multiple wireguide. 4,185,789, Cl. 242-7.110.

Cameron, John T.: *See*—
Sargent, Frank T.; Henke, Arthur W.; Antos, John M.; and Cameron, John T., 4,185,340, Cl. 4-441.000.

Campen, Charles F., Jr.: *See*—
Jahnsen, Vilhelm J.; and Campen, Charles F., Jr., 4,186,187, Cl. 422-64.000.

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Ziegler, Peter; Attwell, Michael C.; Massiah, Thomas F.; and Vergottini, Roberto A., 4,186,143, Cl. 260-397.100.

Canela, Jose; and Gerber, Hans, to Sandoz Ltd. Polyurethanes prepared from alcohols and hydrocarbon polyisocyanates used in textile wet treatment processes. 4,186,119, Cl. 260-29.2TN.

Canon Kabushiki Kaisha: *See*—
Ishiwatari, Masumi, 4,186,436, Cl. 363-60.000.
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,185,909, Cl. 355-15.000.

Cantrell, James E., to Thermal Insulation Company. Baffle board construction. 4,185,433, Cl. 52-404.000.

Capozza, Richard C., to Alza Corporation. Compositions comprising arylene substituted poly(orthoesters) containing useful agents. 4,186,185, Cl. 424-19.000.

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Knoblock, Daryl E.; and Carey, Kenneth O., 4,186,379, Cl. 340-146.10R.

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Aurin, Friedrich, 4,185,892, Cl. 350-171.000.

Carlos, Donald D., to Ashland Oil, Inc. Oxidation of hydrocarbon waxes in the presence of amine oxides. 4,186,077, Cl. 208-3.000.

Carlson, Robert C.; and Stoskopf, Albert H., to Minnesota Mining and Manufacturing Company. Liquid compositions containing triarylsulfonium complex salts and oxyethylene material. 4,186,108, Cl. 252-426.000.

Carlsson, Per A. E.; Carnmalm, Bernt S. E.; Ross, Vante B.; and Ulff, Carl B. J., to Astra Lakemedel Aktiebolag. Phenyl-pyridylamine derivatives. 4,186,202, Cl. 424-263.000.

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Carroll, Robert G.: *See*—
Parker, Sidney D.; Carroll, Robert G.; and Howell, William L., 4,185,457, Cl. 60-204.000.

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Bouette, David W.; Baker, Donald E.; and Cartwright, Fred, 4,185,923, Cl. 366-10.000.

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Seaberg, Richard D., 4,185,944, Cl. 414-621.000.

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Shimura, Noriaki; and Mizuno, Yutaka, 4,186,439, Cl. 364-405.000.

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Atherton, Robert A.; Berchtold, Donald R.; and Easterling, Gene B., 4,185,700, Cl. 172-796.000.
Beals, Charles E., 4,185,521, Cl. 74-865.000.
Gill, Stephen H., 4,185,945, Cl. 414-727.000.
Roley, Robert D., 4,185,391, Cl. 33-168.00R.

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Cocca, Vincenzo; Tommasi, Ivano; and Cau, Pasqualino, 4,186,232, Cl. 428-177.000.

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Cawte, Ronald: *See*—
Johnson, Reginald F.; and Cawte, Ronald, 4,185,442, Cl. 53-168.000.

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Donohoe, David G.; and Clark, Forrest W., 4,185,808, Cl. 248-295.00R.

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Yates, Derek N.; and Presta, John C., 4,185,472, Cl. 64-1.00S.

Central Laboratories of Associated Maryland Pathologists, Ltd.: *See*—
Lancaster, Robert G., 4,185,964, Cl. 23-230.00B.

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Hue, Jean-Pierre; Charles, Christian; and Le Foll, Francois, 4,185,404, Cl. 37-71.000.

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CGEE Alsthom: *See*—
Cailloux, Michel, 4,186,435, Cl. 363-37.000.

Chakrabarty, Naresh; Einzinger, Richard; and Weitze, Artur, to Siemens Aktiengesellschaft. Thick film varistor and method of producing same. 4,186,367, Cl. 338-21.000.

Chamberlain, Albert F.: *See*—
Gall, John C.; Batogowski, Joseph H.; and Chamberlain, Albert F., 4,185,400, Cl. 35-5.000.

Chamberlin, Thomas A.; and Bangs, Sonia W., to Dow Chemical Company, The. Novel complexes of polyoxazolines or polyoxazines and halogens, interhalogens or pseudohalogens and process for preparing same. 4,186,191, Cl. 424-78.000.

Chambers, Ramon P.: *See*—
Gordy, Robert S.; Chambers, Ramon P.; and Sanders, David E., 4,186,349, Cl. 325-323.000.

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Cote, Raymond A., 4,185,764, Cl. 229-16.00R.
McLaren, Edwin C., 4,185,765, Cl. 229-17.00G.

Chandalia, Kiran B.: *See*—
Preston, Frank J.; and Chandalia, Kiran B., 4,186,271, Cl. 568-607.000.

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Hue, Jean-Pierre; Charles, Christian; and Le Foll, Francois, 4,185,404, Cl. 37-71.000.

Chaudry, Khalid O.: *See*—
Taylor, Brian P.; and Chaudry, Khalid O., 4,185,836, Cl. 274-23.00A.

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Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,186,194, Cl. 424-89.000.

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Smith, Robert L., 4,185,352, Cl. 15-246.500.

Cheng, Richard C. M. Teeter-totter track section for model vehicles. 4,185,409, Cl. 46-1.00K.

Chestnokova, Marina P.: *See*—
Ordanian, Sergei S.; Lysanov, Vladislav S.; Digonsky, Viktor V.; Blinkov, Vadim A.; Pekelis, Ljubov A.; Denisova, Vera I.; Unrod, Vladimir I.; Sinelnikov, Sergei V.; and Chestnokova, Marina P., 4,186,022, Cl. 106-43.000.

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Danzik, Mitchell, 4,185,961, Cl. 8-115.500.
Meyer, Jarold A., 4,186,111, Cl. 252-453.000.

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Cho, Alfred Y.; Di Lorenzo, James V.; and Niehaus, William C., to Bell Telephone Laboratories, Incorporated. Nonalloyed ohmic contacts to n-type Group III(a)-V(a) semiconductors. 4,186,410, Cl. 357-67.000.

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Kallin, Ingmar, 4,185,587, Cl. 119-51.110.

Chown, Martin; and Leach, John S., to ITT Industries, Inc. Optical fiber coupling element. 4,185,883, Cl. 350-96.200.

Chown, Martin; and Ramsay, Melvin M., to International Standard Electric Corporation. Optical fiber connector. 4,185,885, Cl. 350-96.180.

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Hubbard, Earl; and Kartanys, Robert J., 4,185,844, Cl. 280-5.00A.

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Machida, Hideo, 4,185,378, Cl. 29-626.000.

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Morse, Max A., 4,185,993, Cl. 71-93.000.

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Blake, Colin C.; and Payne, Ivan C., 4,186,067, Cl. 204-109.000.
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Hall, Adrian B., 4,185,812, Cl. 269-56.000.
Wittwer, Christoph F., 4,185,866, Cl. 294-88.000.

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Citrus Central, Incorporated: *See*—
Brock, James E.; Gentry, Cara M.; and DeUnger, Ray, 4,185,348, Cl. 15-101.000.

Ciupke, Werner W.: *See*—
Sherlock, Hugh P.; Ewry, Edwin E.; Sandvoss, Werner E.; Ciupke, Werner W.; Brown, Glenn E.; and Link, William T., 4,185,899, Cl. 352-72.000.
Clark, Forrest W.: *See*—
Donohoe, David G.; and Clark, Forrest W., 4,185,808, Cl. 248-295.00R.
Clark, Joseph W.: *See*—
Zellers, Dale A.; and Clark, Joseph W., 4,186,061, Cl. 203-96.000.
Clay, Herbert N.: *See*—
Prete, Ernest, Jr.; and Clay, Herbert N., 4,185,360, Cl. 24-68.0CD.
Claydon, Alan G.: *See*—
Molins, Desmond W.; Warner, Brian H.; Claydon, Alan G.; and Watson, Anthony W., 4,185,941, Cl. 406-77.000.
Clews, K. Malcolm: *See*—
Kvapil, Rudolph; and Clews, K. Malcolm, 4,185,871, Cl. 299-2.000.
Clostermeyer, Gerhard; and Jaross, Heinz, to Gebr. Claas Maschinenfabrik GmbH. Bale-forming device. 4,185,446, Cl. 56-344.000.
Clouser, David E.; and Craven, John S., to Hewlett-Packard Company. Phase discrimination in modulated thermal conductivity detector. 4,185,490, Cl. 73-23.100.
CMB Colonia Management-und Beratungsgesellschaft mbH & Co. KG: *See*—
Geiseler, Wolfgang, 4,186,280, Cl. 179-100.10R.
CMI Corporation: *See*—
Swisher, George W., Jr.; and Steele, Thomas L., 4,185,875, Cl. 299-39.000.
Cobel, George B.: *See*—
Skach, Edward J., Jr.; and Cobel, George B., 4,186,000, Cl. 75-0.50B.
Cocca, Vincenzo; Tommasi, Ivano; and Cau, Pasqualino, to Montedison S.p.A. Self-supporting roof panel of plastic material for motor vehicles and the like. 4,186,232, Cl. 428-177.000.
Cochran, Thomas J.: *See*—
Buchmann, Albert H.; Cochran, Thomas J.; Ficker, Walter W.; Stricker, Alfred A.; and von Kaenel, Walter, 4,185,814, Cl. 271-108.000.
Cohen, Noal, to Hoffmann-La Roche Inc. Preparation of chroman-2-acetic acids. 4,186,138, Cl. 260-345.500.
Coleco Industries, Inc.: *See*—
Bromley, Eric, 4,185,825, Cl. 273-101.200.
Colery, Jean-Claude: *See*—
Brichard, Jean; and Colery, Jean-Claude, 4,185,960, Cl. 8-111.000.
Collignon, Claude: *See*—
Thominet, Michel; Bulteau, Gerard; Acher, Jacques; and Collignon, Claude, 4,186,135, Cl. 260-326.340.
Colwell, Richard R.: *See*—
Necker, Carl G.; and Colwell, Richard R., 4,186,306, Cl. 250-360.000.
Comer, William T.: *See*—
Kreighbaum, William E.; and Comer, William T., 4,186,131, Cl. 548-251.000.
Commissariat a l'Energie Atomique: *See*—
Basire, Alain; Roche, Pierre; and Thenard, Jean, 4,186,301, Cl. 250-204.000.
Commissariate a l'Energie Atomique: *See*—
Duchene, Alain; Malet, Jean-Claude; and Neu, Francis, 4,185,780, Cl. 239-553.500.
Commonwealth Scientific and Industrial Research Organization: *See*—
Minnett, Harry C.; and Cooper, Brian F. C., 4,186,398, Cl. 343-100.0SA.
Compagnie General d'Electricite: *See*—
Boutineau, Jean-Louis, 4,186,353, Cl. 330-4.300.
Compagnie Generale des Etablissements Michelin: *See*—
Raluy, Antoine, 4,185,676, Cl. 152-362.00R.
Conken, Chester S. Aluminum pack tree. 4,185,444, Cl. 54-37.000.
Conoco, Inc.: *See*—
Crumb, Robert E.; Martin, William L.; and Young, Gary C., 4,185,693, Cl. 166-259.000.
Oberlander, Richard K., 4,186,178, Cl. 423-265.000.
Consolidated Foods Corporation: *See*—
Kosik, John; and Ritzau, William P., 4,185,976, Cl. 55-373.000.
Consolidation Coal Company: *See*—
Faix, James E., 4,185,660, Cl. 137-625.640.
Continental Group, Inc., The: *See*—
Giggard, Earl D., 4,185,758, Cl. 222-386.500.
Conveyersmith, Inc.: *See*—
Church, Thomas A.; and Johnson, Theodore W., 4,185,681, Cl. 164-154.000.
Cook, Robert A.: *See*—
Waclawik, Francis J.; Muzaca, James P.; Cook, Robert A.; Hardin, William A.; Silvia, Alfred D.; and Correia, Ronald, 4,185,345, Cl. 9-8.00R.
Cooper, Brian F. C.: *See*—
Minnett, Harry C.; and Cooper, Brian F. C., 4,186,398, Cl. 343-100.0SA.
Cooper, James L.: *See*—
Oberheim, Thomas E.; and Cooper, James L., 4,185,531, Cl. 84-1.110.
Copper Refineries Pty. Limited: *See*—
Perry, Ian J., 4,186,074, Cl. 204-286.000.
Corey, Harold, to Population Research, Inc. Promotion of fibrous tissue growth in fallopian tubes for female sterilization. 4,185,618, Cl. 128-1.00R.
Corning Glass Works: *See*—
Chyung, Kenneth; and Wusirika, Raja R., 4,186,021, Cl. 106-39.600.
Corrales, Patrick G., to International Telephone and Telegraph Corporation. Fiber optic connector. 4,185,886, Cl. 350-96.210.
Correia, Ronald: *See*—
Waclawik, Francis J.; Muzaca, James P.; Cook, Robert A.; Hardin, William A.; Silvia, Alfred D.; and Correia, Ronald, 4,185,345, Cl. 9-8.00R.
Cote, Raymond A., to Champion International Corporation. Snap-up bottom, flat folded scoop-type carton. 4,185,764, Cl. 229-16.00R.
Cotton, Lawrence M., to Stanley Works, The. Accessory for routing apparatus. 4,185,671, Cl. 144-134.00D.
Cove, Les. Stringed musical instruments with foamed solid bodies. 4,185,534, Cl. 84-291.000.
Cowett, Philip M., Jr., to United States of America, Army. Means for producing and controlling dead-time of the switching transistors DC-to-DC and DC-to-AC converters. 4,186,434, Cl. 363-24.000.
Coyne & Bellier, Bureau d' ingenieurs Conseils: *See*—
Guerber, Paul L., 4,185,703, Cl. 175-17.000.
Cozzoli Machine Co.: *See*—
McMickle, John F., 4,185,732, Cl. 198-455.000.
Cragg, William D.; and Lawson, Anthony N., to International Standard Electric Corporation. Piezoelectric high polymer, multilayer electro-acoustic transducers. 4,186,323, Cl. 310-324.000.
Craven, John S.: *See*—
Clouser, David E.; and Craven, John S., 4,185,490, Cl. 73-23.100.
Creative Tool Company: *See*—
Yelke, Edward, 4,185,494, Cl. 73-119.00A.
Cri-Dan: *See*—
Laurent, Roland R., 4,185,524, Cl. 82-2.00R.
Crompton & Knowles Corporation: *See*—
Magill, Jacques R., 4,185,957, Cl. 8-2.50R.
Cross, Peter E.: *See*—
Barnish, Ian T.; Cross, Peter E.; Danilewicz, John C.; and Morville, Malcolm, 4,186,210, Cl. 424-324.000.
Crouse, Vernon J., III; and Farmer, Robert F., III, to Gillette Company, The. Molasses chewing gum. 4,186,214, Cl. 426-3.000.
Crumb, Robert E.; Martin, William L.; and Young, Gary C., to Conoco, Inc. Oile shale retorting from a high porosity cavern. 4,185,693, Cl. 166-259.000.
Crump, John M., Jr. Vehicle energy conservation indicating device and process for use. 4,186,296, Cl. 235-61.00J.
Crystal Sewing Machine Ind. Co., Ltd.: *See*—
Naito, Hajime, 4,185,573, Cl. 112-183.000.
Cubic Western Data: *See*—
Roes, John B.; and Moore, Royal C., 4,185,730, Cl. 194-4.00R.
Cue, Berkeley W.: *See*—
Gassman, Paul G.; and Cue, Berkeley W., 4,186,132, Cl. 260-325.00R.
Cuffe, Patricia M.: *See*—
Rotenberg, Don H.; Cuffe, Patricia M.; and Laurin, Bernard L., 4,186,026, Cl. 106-287.140.
Cuk, Slobodan M., to California Institute of Technology. Push-pull switching power amplifier. 4,186,437, Cl. 363-65.000.
Cullis, Herbert M.; DeVries, James H.; Lohr, David A.; Rodriquez, Rodolfo R.; and Uffer, Michael B., to Baxter Travenol Laboratories, Inc. Method and apparatus for processing blood. 4,185,629, Cl. 128-214.00R.
Cummings, Donald R. Providing energy from the combustion of methanol. 4,185,456, Cl. 60-39.020.
Cummings, William M.: *See*—
Schlicht, Raymond C.; and Cummings, William M., 4,185,965, Cl. 44-63.000.
Cunningham, Ralph. Door opening system. 4,185,859, Cl. 292-93.000.
Cupolo, John; Salisbury, David J.; and Ouellette, Charles W., to Raytheon Company. Stabilized sonobuoy suspension. 4,186,370, Cl. 367-4.000.
Curtis Instruments, Inc.: *See*—
Finger, Eugene P., 4,186,339, Cl. 324-142.000.
Cuscurida, Michael; and Zimmerman, Robert L., to Texaco Development Corporation. Amine derivatives and use as polyurethane catalyst. 4,186,254, Cl. 521-115.000.
Cutter Laboratories, Inc.: *See*—
Lundblad, John L.; Warner, Willis L.; and Fernandes, Peter M., 4,186,192, Cl. 424-85.000.
Cybernet Electronic Corp.: *See*—
Kakigi, Takao, 4,186,343, Cl. 325-17.000.
Czech, Johannes; and Dorntlein, Peter, to Licentia Patent-Verwaltung-G.m.b.H. Adjustable coaxial line-to-microstrip line transition. 4,186,358, Cl. 333-33.000.
Czerepinski, Ralph G.: *See*—
Garrett, Walter L.; and Czerepinski, Ralph G., 4,186,250, Cl. 96-33.000.
daCosta, Harry; and Krichbaum, Paul L., to Motorola, Inc. Apparatus for measuring the magnetic strength of magnetic work pieces. 4,186,340, Cl. 324-205.000.
Dahms, Jurgen: *See*—
Hofflinger, Bernd; and Dahms, Jurgen, 4,186,383, Cl. 340-347.0DA.
Dai Nippon Toryo Company: *See*—
Sakashita, Kazumi; Hiratsuka, Kenji; Umezu, Yutaka; Nakamura, Nobuo; and Noda, Haruhisa, 4,186,234, Cl. 428-283.000.
Daley, Thomas G. Method of making a platen core. 4,186,162, Cl. 264-46.500.
D'Amico, John J., to Monsanto Company. Imides derived from 2-oxo-3-benzothiazolineacetic acid and butyric acid. 4,185,990, Cl. 71-90.000.
Daniello, Margaret M. Unitary article-carrying bag and cushion. 4,185,673, Cl. 150-33.000.

Danilewicz, John C.: *See—*
Barnish, Ian T.; Cross, Peter E.; Danilewicz, John C.; and Morville, Malcolm, 4,186,210, Cl. 424-324.000.

Danner, Bill A., to Fiat-Allis Construction Machinery, Inc. Two-element lip-type seal. 4,185,838, Cl. 277-58.000.

Dantzer, Elonne: *See—*
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; Benkoe, Elisabeth, executrix; Dantzer, Elonne; La Dow, William R.; Ginn, Wayne M.; and Dyson, L. Ray, 4,185,413, Cl. 46-118.000.

Danzik, Mitchell, to Chevron Research Company. Polypyrrolidone fiber treatment. 4,185,961, Cl. 8-115.500.

D'Arcangelis, Dora: *See—*
Gaafar, Hassan A.; and D'Arcangelis, Dora, 4,186,182, Cl. 424-1.000.

Darrow, Kenneth A.; and Pagnotta, Gasper, to General Electric Company. Method of manufacture of cooled turbine or compressor buckets. 4,185,369, Cl. 29-156.80B.

David, Nicholas F., to H. Koch & Sons Division (Gulf & Western Mfg. Co.). Handle for manipulating lever. 4,185,363, Cl. 24-230.00A.

Davidson, Thomas L.; and Hackenberg, Robert A., to Robertson Paper Box Co., Inc. Two bulb carton. 4,185,766, Cl. 229-39.00B.

Davies, Chadwick O.: *See—*
Pascouet, Adrien P.; and Davies, Chadwick O., 4,185,714, Cl. 181-120.000.

Davis, Donald C.: *See—*
Romine, Donald J.; Davis, Donald C.; Woodruff, Phillip R.; Young, Ching T.; Bode, James D.; and Tien, Tseng Y., 4,186,071, Cl. 204-195.00S.

Davis, Gerald T.: *See—*
Spatz, Sydney M.; Hydell, Robert C.; and Davis, Gerald T., 4,186,115, Cl. 260-22.00R.

Davis, Jay P.; Grace, Henry C.; and Nabors, James B., to Ciba-Geigy Corporation. Separation of a tris(alkylamino)-s-triazine by-product from chloro-bis(alkylamino)-s-triazines. 4,186,265, Cl. 544-204.000.

Davis, Laddie D.: *See—*
Davis, Stephen D., 4,185,362, Cl. 24-134.00L.

Davis, Robert H.: *See—*
Schick, John W.; Davis, Robert H.; and Andress, Harry J., 4,185,485, Cl. 72-42.000.

Davis, Stephen D., to Davis, Stephen D.; and Davis, Laddie D. Tensioning device. 4,185,362, Cl. 24-134.00L.

Day, Curtis H.: *See—*
Gill, Arthur W.; Loup, Ronald L.; and Day, Curtis H., 4,185,661, Cl. 137-625.650.

Dayco Corporation: *See—*
Howerton, Anderson W.; and Burris, Lee R., 4,185,447, Cl. 56-376.000.

Deabriges, Jean; Ferre, Yves; and Goumont, Claude, to Eastman Kodak Company. Process of formation of color images, photographic product and treatment solutions useful therein. 4,186,004, Cl. 430-218.000.

Dean, Ralph R. Paint spray booth composition. 4,185,970, Cl. 55-89.000.

Debat, Jacques, to Societe Dite: Institut de Recherches Chimiques et Biologiques Appliquees-I.R.C.E.B.A. Higher alkanol compositions and the use thereof in treatment of prostate disorders. 4,186,211, Cl. 424-343.000.

deBuhr, Alfred P.; Meyer, Bruce R.; and Wilson, Robert J., to General Motors Corporation. Rotating element rotational speed signal calibrating system. 4,186,331, Cl. 318-52.000.

Decker, Donald L.; and Temple, Paul A., to United States of America, Navy. Adiabatic laser calorimeter. 4,185,497, Cl. 73-190.0EW.

Deep Oil Technology, Inc.: *See—*
Horton, Edward E., 4,185,694, Cl. 166-350.000.

Deere & Company: *See—*
Swanson, Larry D., 4,186,291, Cl. 200-61.860.

Deffeyes, Robert J.; and Armstrong, Harris W., to Graham Magnetics Inc. Novel silver powder composition. 4,186,244, Cl. 428-570.000.

de Fillain, Paul de Cointet: *See—*
Pigerol, Charles; Chandavoine, Marie-Madeleine; Chignac, Michel; and de Fillain, Paul de Cointet, 4,186,137, Cl. 549-79.000.

Delagebeaudeuf, Daniel; and Pearsall, Thomas, to Thomson-CSF. Heterojunction avalanche diode with a ternary alloy of gallium, indium and arsenic, and a binary alloy of indium and phosphorus. 4,186,407, Cl. 357-13.000.

DeLai, A. Joseph; and Gazzara, Charles P., to United States of America, Army. Growing doped single crystal ceramic materials. 4,186,046, Cl. 156-605.000.

Delerue, Dominique M. Reeling machine for forming a hank. 4,185,790, Cl. 242-53.000.

Delfau, Paul: *See—*
Guyot, Pierre; Delfau, Paul; and Amaury, Robert, 4,186,404, Cl. 346-29.000.

Delkor Technik (Proprietary) Limited: *See—*
Stielau, Theodor M., 4,186,092, Cl. 210-77.000.

Delsarte, Jacques, to Produits Chimiques Ugine Kuhlmann. Method for the manufacture of graft copolymers. 4,186,155, Cl. 525-78.000.

Delta Plastics Limited: *See—*
Burford, John R.; and Slater, Paul, 4,185,635, Cl. 128-330.000.

de Manuele, Mario: *See—*
Di Gioacchino, Alberto; Tommasi, Giulio; and de Manuele, Mario, 4,186,180, Cl. 423-469.000.

Den-tal-ez of Canada Ltd.: *See—*
Simor, Anton A., 4,185,385, Cl. 32-22.000.

Denisova, Vera I.: *See—*
Ordanian, Sergei S.; Lysanov, Vladislav S.; Digonsky, Viktor V.; Blinkov, Vadim A.; Pekelis, Ljubov A.; Denisova, Vera I.; Unrod, Vladimir I.; Sinelnikov, Sergei V.; and Chestnokova, Marina P., 4,186,022, Cl. 106-43.000.

de Nora, Oronzio; Giuffre, Luigi; and Modica, Giovanni, to Oronzio deNora Impianti Elettrochimici S.p.A. Composite diaphragms. 4,186,076, Cl. 204-295.000.

DeUnger, Ray: *See—*
Brock, James E.; Gentry, Cara M.; and DeUnger, Ray, 4,185,348, Cl. 15-101.000.

Deverrewaere, Alain, to Cibie Projecteurs. Device for adjusting the inclination of automobile headlights. 4,186,428, Cl. 362-66.000.

DeVries, James H.: *See—*
Cullis, Herbert M.; DeVries, James H.; Lohr, David A.; Rodriquez, Rodolfo R.; and Uffer, Michael B., 4,185,629, Cl. 128-214.00R.

Dhein, Rolf; Fleiter, Lothar; and Beer, Wolfgang, to Bayer Aktiengesellschaft. Air-drying and oven-drying acrylate lacquer binders. 4,186,116, Cl. 260-23.0AR.

Diagnostic Information, Inc.: *See—*
Wang, Shih-Ping, 4,186,302, Cl. 250-213.0VT.

Diamond Shamrock Corporation: *See—*
Cawley, William H.; and Rowe, Edward A., Jr., 4,186,035, Cl. 148-6.160.
Neumeier, Erich; and Marver, Douglas J., 4,185,630, Cl. 128-283.000.

Dickenson, Robert, to Rohr Industries, Inc. Thrust reverser–cascade two door pre-exit. 4,185,798, Cl. 244-110.00B.

Didier Engineering GmbH: *See—*
Muller, Hans-Hermann; and Wulfmeier, Johannes, 4,186,056, Cl. 202-250.000.

Dieterich, Dieter: *See—*
Reischl, Artur; Wenzel, Wolfgang; and Dieterich, Dieter, 4,186,118, Cl. 260-29.2TN.

Dietz, Richard E., to Phillips Petroleum Company. Olefin polymerization process. 4,186,260, Cl. 526-106.000.

Digate, James S., to Scholl, Inc. Deodorizing insole. 4,185,402, Cl. 36-44.000.

Diggs, Richard E. High efficiency wind power machine. 4,186,314, Cl. 290-55.000.

Di Gioacchino, Alberto; Tommasi, Giulio; and de Manuele, Mario, to Montedison S.p.A. Method for the preparation of sulphur hexafluoride of high purity. 4,186,180, Cl. 423-469.000.

Digonsky, Viktor V.: *See—*
Ordanian, Sergei S.; Lysanov, Vladislav S.; Digonsky, Viktor V.; Blinkov, Vadim A.; Pekelis, Ljubov A.; Denisova, Vera I.; Unrod, Vladimir I.; Sinelnikov, Sergei V.; and Chestnokova, Marina P., 4,186,022, Cl. 106-43.000.

Dilmore, Colonel R.; Hoover, Edsel V.; and Kriss, Allan B., to PPG Industries, Inc. Method of preparing a resin-containing asbestos diaphragm. 4,186,065, Cl. 204-98.000.

Di Lorenzo, James V.: *See—*
Cho, Alfred Y.; Di Lorenzo, James V.; and Niehaus, William C., 4,186,410, Cl. 357-67.000.

DiMatteo, Paul L.; Ross, Joseph A.; and Stern, Howard K., to Solid Photography Inc. Arrangement for sensing the characteristics of a surface and determining the position of points thereon. 4,185,918, Cl. 356-375.000.

D'Intino, Vito. Holder for circular fabric cutter. 4,185,526, Cl. 82-44.000.

Director-General of Agency of Industrial Science and Technology: *See—*
Kato, Yoshishige, 4,186,087, Cl. 210-44.000.

Disogrin Industries Corporation: *See—*
Sprey, Raymond E., 4,186,261, Cl. 528-75.000.

Dixon "Y" Machine, Incorporated: *See—*
Williams, Rodney B.; and Taylor, Jerry A., 4,185,696, Cl. 171-38.000.
Williams, Rodney B.; and Taylor, Jerry A., 4,185,713, Cl. 180-242.000.

Dochterman, Richard W., to General Electric Company. Dynamoelectric machine end shield. 4,186,319, Cl. 310-89.000.

Dr. Beck & Co. AG: *See—*
Janssen, Harald, 4,186,241, Cl. 428-458.000.

Dr. Boger Photosatz GmbH: *See—*
Holthusen, Bernd, 4,185,914, Cl. 355-70.000.

Dodson, George B., to Bose Corporation. Stereophonic system having power amplifiers and speakers in a bridge circuit with capacitor connecting junction of speakers to common terminal. 4,186,273, Cl. 179-1.00G.

Dominion Engineering Works Limited: *See—*
Nelson, John E., 4,185,785, Cl. 241-70.000.

Domyan, Frank F., to Koso Service Co., Ltd. Acceleration responsive tripping mechanism. 4,185,507, Cl. 74-2.000.

Donohoe, David G.; and Clark, Forrest W., to CBS Inc. Connector hardware for percussive instruments. 4,185,808, Cl. 248-295.00R.

Dorne, Arthur. Antenna formed of non-uniform series connected sections. 4,186,403, Cl. 343-801.000.

Dorner, Florian: *See—*
Sachs, Hermann W.; Marek, Peter; and Dorner, Florian, 4,185,755, Cl. 222-43.000.

Dorntlein, Peter: *See—*
Czech, Johannes; and Dorntlein, Peter, 4,186,358, Cl. 333-33.000.

Double A Products: *See—*
Gill, Arthur W.; Loup, Ronald L.; and Day, Curtis H., 4,185,661, Cl. 137-625.650.

Dow Chemical Company, The: *See—*
Chamberlin, Thomas A.; and Bangs, Sonia W., 4,186,191, Cl. 424-78.000.

Dowd, William; and Naffziger, David H., 4,186,270, Cl. 562-496.000.
Elms, William J.; and Weitzel, Steven A., 4,186,036, Cl. 148-6.15R.
Garrett, Walter L.; and Czerepinski, Ralph G., 4,186,250, Cl. 96-33.000.
Gibbs, Dale S., 4,186,156, Cl. 529-78.000.
Krajewski, Richard M.; and Erickson, Robert E., 4,186,233, Cl. 428-213.000.
Potts, Irwin W., 4,186,153, Cl. 260-650.00R.
Rubens, Louis C., 4,186,068, Cl. 204-159.200.
Skach, Edward J., Jr.; and Cobel, George B., 4,186,000, Cl. 75-0.50B.
Ward, Eldon L., 4,186,086, Cl. 210-37.00R.

Dowd, William; and Naffziger, David H., to Dow Chemical Company, The. Process for making 2-(4-isobutylphenyl)propionic acid and related compounds. 4,186,270, Cl. 562-496.000.

Dowling, Edward H.: *See—*
Ulmschneider, Lawrence A.; and Dowling, Edward H., 4,186,161, Cl. 264-37.000.

Downing, Anthony P.: *See—*
Rees, John M.; Horler, Christopher A.; and Downing, Anthony P., 4,185,922, Cl. 316-5.000.

Drechsel, Dieter: *See—*
Jericho, Karl; Floymayr, Joachim; Reimpell, Uwe; and Drechsel, Dieter, 4,186,173, Cl. 422-250.000.

Dremann, George H. Fluid material flow control valve. 4,185,806, Cl. 251-61.100.

Dresser Industries, Inc.: *See—*
Zabsky, John M.; and Marshall, John R., 4,185,664, Cl. 138-40.000.

Drew, Willis P.: *See—*
Fisk, Dwight; and Drew, Willis P., 4,185,742, Cl. 206-414.000.

Drimmer, Bernard E.; and Moffett, Everett L., to United States of America, Navy. Underwater cable cutting device. 4,185,551, Cl. 102-15.000.

Drlik, Romuald J., to Envirotech Corporation. Spray nozzle. 4,185,778, Cl. 239-405.000.

Duchene, Alain; Malet, Jean-Claude; and Neu, Francis, to Commissariate a l'Energie Atomique; and S.A. des Establissements NEU. Powder-distributing device. 4,185,780, Cl. 239-553.500.

Dudley, Robert H.; and Halisek, Frank C., to Reclamet, Inc. Shiftable bottom wall for separator bowl and wear shoe therefor. 4,186,097, Cl. 210-377.000.

Dumesnil, Maurice E.; and Schreier, Ulrich, to Technology Glass Corporation. Sealing glass composition. 4,186,023, Cl. 106-53.000.

Dunham-Bush, Inc.: *See—*
Shaw, David N., 4,185,465, Cl. 60-678.000.

Du Pont de Nemours, E. I., and Company: *See—*
Fang, James C., 4,186,084, Cl. 210-23.00H.
Gangal, Subhash V., 4,186,121, Cl. 260-29.60F.

Dupree, Clifford A.; and Entz, Charles. Wheel hub support removal means. 4,185,372, Cl. 29-275.000.

Durling, Bengt, to AB Halldemaskiner. Apparatus for disintegrating foodstuffs, especially fruit and vegetable foodstuffs. 4,185,788, Cl. 241-285.00A.

Dvorak, Sidney T. AC Electrical power systems with alternate sources of power. 4,186,312, Cl. 290-4.00R.

Dyckerhoff & Widmann Aktiengesellschaft: *See—*
Finsterwalder, Ulrich, 4,185,440, Cl. 52-741.000.

Dynamics Corporation of America: *See—*
Lewison, Howard L., 4,185,699, Cl. 172-724.000.

Dynamit Nobel AG: *See—*
Webermeier, Kurt; Wissinger, Waldemar; and Rulle, Otto, 4,185,951, Cl. 425-133.500.

Dynamit Nobel Aktiengesellschaft: *See—*
Wulff, Helmut; and Hass, Hans-Jurgen, 4,186,227, Cl. 427-388.00A.

Dyson, L. Ray: *See—*
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; Benkoe, Elisabeth, executrix; Dantzer, Elonne; La Dow, William R.; Ginn, Wayne M.; and Dyson, L. Ray, 4,185,413, Cl. 46-118.000.

E.B. Eddy Forest Products, Ltd.: *See—*
Gladish, Herbert E., 4,185,399, Cl. 34-120.000.

E. R. Squibb & Sons, Inc.: *See—*
Petrillo, Edward W., Jr., 4,186,268, Cl. 546-21.000.

E-Systems, Inc.: *See—*
Gordy, Robert S.; Chambers, Ramon P.; and Sanders, David E., 4,186,349, Cl. 325-323.000.

Eadie, Brian K. M.; Parker, William H. C.; and White, William A., to Eadie Bros. & Co., Limited. Travellers for ring spinning machines. 4,185,449, Cl. 57-125.000.

Eadie Bros. & Co., Limited: *See—*
Eadie, Brian K. M.; Parker, William H. C.; and White, William A., 4,185,449, Cl. 57-125.000.

Easterling, Gene B.: *See—*
Atherton, Robert A.; Berchtold, Donald R.; and Easterling, Gene B., 4,185,700, Cl. 172-796.000.

Easterling, Mahlon F.: *See—*
United States of America, National Aeronautics and Space Administration; Brockman, Milton H.; and Easterling, Mahlon F., 4,186,347, Cl. 325-305.000.

Eastman Kodak Company: *See—*
Deabriges, Jean; Ferre, Yves; and Goumont, Claude, 4,186,004, Cl. 430-218.000.
Jones, Cynthia G., 4,186,009, Cl. 430-353.000.
Schmidt, Robert R., III; and Holmes, Jerry D., 4,186,258, Cl. 525-342.000.

Ulmschneider, Lawrence A.; and Dowling, Edward H., 4,186,161, Cl. 264-37.000.

Eaton Corporation: *See—*
Rohrer, Douglas D., 4,185,726, Cl. 192-58.00B.
Schmidt, John, Jr.; and Martin, Donald E., 4,186,363, Cl. 335-278.000.

Eber, Nicolas. Rectifier for absorption cooling unit. 4,185,470, Cl. 62-496.000.

Eco Tec Limited: *See—*
Hunter, Robert F.; and Spinner, Irving H., 4,186,174, Cl. 423-54.000.

Eddy, Herbert C. Liquid crystal thermograph frame assembly. 4,185,904, Cl. 354-80.000.

Edwards, E. David. Adapter for motor-speed reducer sets. 4,185,514, Cl. 74-425.000.

Edwin, Allan I.; and Bennett, Melvin T., to Minnesota Mining and Manufacturing Company. Multi-terminal computer system with dual communication channels. 4,186,380, Cl. 340-147.0SC.

Egawa, Eiko, to Watanabe, Ineko, a part interest. Heat-preserving appliance for cups or other vessels. 4,185,614, Cl. 126-265.000.

Ehrenreich, Arthur D.: *See—*
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.

Eichenberger, Walter; and Hilge, Bernhard, to Swiss Aluminium Ltd. Device for cooling long items of material which have been heated. 4,185,810, Cl. 266-259.000.

Eidschun, Charles D., to Micro-Plate, Inc. Continuous tab plater and method. 4,186,062, Cl. 204-15.000.

Einzinger, Richard: *See—*
Chakrabarty, Naresh; Einzinger, Richard; and Weitze, Artur, 4,186,367, Cl. 338-21.000.

Electricite de France (Service Nationl) & Pechiney Ugine-Kuhlman: *See—*
Blum, Jacques M.; and Ventre, Edmond, 4,186,049, Cl. 176-38.000.

Electro Signal Lab, Inc.: *See—*
Enemark, Robert B., 4,186,390, Cl. 340-630.000.

Electromatic Drive Corporation: *See—*
Hillman, Darrel D., 4,186,320, Cl. 310-93.000.

Eli Lilly and Company: *See—*
Harrison, Roger G.; Jamieson, William B.; Ross, William J.; and Saunders, John C., 4,186,204, Cl. 424-269.000.

Ellouz, Fabrielle: *See—*
Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,186,194, Cl. 424-89.000.

Ellson, John C., to Northern Telecom Limited. Method and apparatus for measuring telephone line characteristics. 4,186,282, Cl. 179-175.30R.

Elms, William J.; and Weitzel, Steven A., to Dow Chemical Company, The. Weldable coating compositions. 4,186,036, Cl. 148-6.15R.

Eltsov, Konstantin S.: *See—*
Medovar, Boris I.; Artamonov, Viktor L.; Bogachenko, Alexei G.; Shtanko, Jury P.; Bondarenko, Oleg P.; Eltsov, Konstantin S.; Stetsenko, Nikolai V.; Popov, Sergei S.; Kaganovsky, Gary P.; and Korotkov, Albert N., 4,185,683, Cl. 164-252.000.

Embach, James T.: *See—*
Sargent, Frank T.; Antos, John M.; Henke, Arthur W.; Embach, James T.; Butler, Frederick A.; and Lindsay, Erin J., 4,185,337, Cl. 4-300.000.

EMI Limited: *See—*
Fairbairn, Ian A., 4,186,329, Cl. 315-241.00R.

Enemark, Robert B., to Electro Signal Lab, Inc. Battery powered smoke detector. 4,186,390, Cl. 340-630.000.

Engel Industries, Inc: *See—*
Merideth, Dallas L., 4,185,487, Cl. 72-315.000.

Engel, Joseph C.; and Hines, George, to Westinghouse Electric Corp. Linear light source. 4,186,431, Cl. 362-223.000.

Engineering & Research Associates, Inc.: *See—*
Acker, Loren C., 4,186,292, Cl. 219-10.810.

English Clays Lovering Pochin & Company Limited: *See—*
Bell, David G.; and Gibson, Keith R., 4,186,027, Cl. 106-288.00B.

Engraving Specialists (Leicester) Ltd.: *See—*
Parsons, Roy B., 4,186,170, Cl. 264-247.000.

Entz, Charles: *See—*
Dupree, Clifford A.; and Entz, Charles, 4,185,372, Cl. 29-275.000.

Envirotech Corporation: *See—*
Drlik, Romuald J., 4,185,778, Cl. 239-405.000.

Equipment Company of America: *See—*
Thurmond, Elmer T., Jr., 4,185,853, Cl. 280-652.000.

Erdman Charles A.: *See—*
Pelensky, Joseph; and Erdman Charles A., 4,186,405, Cl. 346-140.00A.

Erickson, Edward H., to Riker Laboratories, Inc. Methods of using 8(tetrazol-5-ylcarbamoyl)isoquinoline compounds. 4,186,201, Cl. 424-258.000.

Erickson, Robert E.: *See—*
Krajewski, Richard M.; and Erickson, Robert E., 4,186,233, Cl. 428-213.000.

Erikson, Herman E., to Polaroid Corporation. Large format photographic film cassette. 4,186,308, Cl. 250-480.000.

Eriksson, Lars. Elements for supporting and bracing sealed-glazing units. 4,185,432, Cl. 52-400.000.

Ernst, Richard C., to United States of America, Air Force. Turbofan augmentor flameholder. 4,185,458, Cl. 60-261.000.

Esch, Ronald P.; and Huang, Patrick C., to International Business Machines Corporation. IGFET with partial planar oxide. 4,186,408, Cl. 357-23.000.
Estes, Nelson N.: *See—*
Wilson, Louis; and Estes, Nelson N., 4,185,555, Cl. 102-18.00R.
Etablissements Francois Salomon et Fils: *See—*
Salomon, Georges P. J., 4,185,851, Cl. 280-613.000.
Etablissements le Simplex: *See—*
Juy, Lucien C. H., deceased, 4,185,510, Cl. 74-217.00B.
Etat Francais, Delegation Ministerielle pour l'Armement: *See—*
Pujol, Jean-Claude; Gerard, Jean-Pierre; Madec, Paul; and Metaut, Daniel, 4,185,580, Cl. 114-321.000.
Etat Francais Societe Anonyme de Telecommunication: *See—*
Marie, Georges R. P.; Allanic, Jacques; and Peltier, Yves J., 4,185,889, Cl. 350-96.320.
Ethicon, Inc.: *See—*
Mattei, Frank V., 4,185,637, Cl. 128-335.500.
Shalaby, Shalaby W.; and Jamiolkowski, Dennis D., 4,186,189, Cl. 424-78.000.
Ethyl Corporation: *See—*
Malec, Robert E., 4,186,102, Cl. 252-51.50R.
Perilstein, Warren L., 4,185,594, Cl. 123-1.00A.
Walter, Thomas J., 4,186,147, Cl. 260-578.000.
Eue, Ludwig: *See—*
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,185,991, Cl. 71-92.000.
Evans, James L., to Kelsey Hayes Co. Method of making a wheel rim. 4,185,370, Cl. 29-159.100.
Evans, John H.: *See—*
Moore, Phillip L.; and Evans, John H., 4,185,751, Cl. 220-203.000.
Ewart, James M.; Anderson, Clay H.; and St. Jean, Gerard, to C. H. Anderson and Associates Ltd. Universal coupling. 4,185,513, Cl. 74-425.000.
Ewing, Josh, to Burke Company, The. Apparatus and method for constructing adjustable curvilinear concrete forms. 4,185,805, Cl. 249-210.000.
Ewry, Edwin E.: *See—*
Sherlock, Hugh P.; Ewry, Edwin E.; Sandvoss, Werner E.; Ciupke, Werner W.; Brown, Glenn E.; and Link, William T., 4,185,899, Cl. 352-72.000.
Exner, Gerhard; Festinori, Volfango; and Luckschus, Detlef, to Kraftwerk Union Aktiengesellschaft. Apparatus for measuring the pre-tension of a threaded bolt. 4,185,504, Cl. 73-761.000.
Exner, Gerhard; Festinori, Volfango; and Luckschus, Detlef, to Kraftwerk Union Aktiengesellschaft. Apparatus for measuring the pre-tension of a threaded bolt. 4,185,505, Cl. 73-761.000.
Exner, Gerhard; Festinori, Volfango; and Luckschus, Detlef, to Kraftwerk Union Aktiengesellschaft. Apparatus for measuring the pre-tension of a threaded bolt. 4,185,506, Cl. 73-761.000.
Exxon Research & Engineering Co.: *See—*
Brenner, Douglas; and Lundberg, Robert D., 4,186,163, Cl. 264-54.000.
Kistler, Jean P.; and Guinot, Michel, 4,185,988, Cl. 71-27.000.
Savage, David W., 4,186,085, Cl. 210-27.000.
F. J. Burrus & Cie: *See—*
Boegli, Serge; and Lebet, Jean-Pierre, 4,185,645, Cl. 131-261.00R.
Fa. Develop KG, Dr. Eisbein and Co.: *See—*
Moser, Kurt; and Kaufmann, Heinrich, 4,185,745, Cl. 206-556.000.
Face, William W., to Microelectronic Communications Corporation. Stored program telephone dialer. 4,186,279, Cl. 179-90.00B.
Fahnoe, Harold H., to S&C Electric Company. Translucent housing for a circuit interrupting device. 4,186,365, Cl. 337-206.000.
Fairbairn, Ian A., to EMI Limited. Electrical power supplies. 4,186,329, Cl. 315-241.00R.
Faix, James E., to Consolidation Coal Company. Directional control valve. 4,185,660, Cl. 137-625.640.
Falk, Helmut: *See—*
Hebert, Donald G., 4,185,929, Cl. 400-124.000.
Fang, James C., to Du Pont de Nemours, E. I., and Company. Hydrophilic fluoropolymers. 4,186,084, Cl. 210-23.00H.
Farmer, Robert F., III: *See—*
Crouse, Vernon J., III; and Farmer, Robert F., III, 4,186,214, Cl. 426-3.000.
Farmos-Yhtyma Oy: *See—*
Tilkanen, Simo O., 4,185,987, Cl. 71-24.000.
Farris, Richard C.; and Butler, William S., to Halliburton Company. Truck damping. 4,185,719, Cl. 188-33.000.
Faulbecker, Gerd: *See—*
Kleinschmidt, Hans-Joachim; and Faulbecker, Gerd, 4,185,475, Cl. 64-21.000.
FBM International, Inc.: *See—*
Peterson, Bertel R., 4,185,744, Cl. 206-427.000.
Febbo, Anthony R., to PPG Industries, Inc. Method and apparatus for protecting tong-suspended glass sheets from buffeting. 4,185,983, Cl. 65-104.000.
Fegan, Lloyd V., r., to Bethlehem Steel Corporation. Particulate size separator and method of operating. 4,185,746, Cl. 209-691.000.
Feinstein, Samuel P.: *See—*
United States of America, National Aeronautics and Space Administration; and Feinstein, Samuel P., 4,185,493, Cl. 73-56.000.
Fermaglich, Saul: *See—*
Volent, Ivan; and Fermaglich, Saul, 4,185,915, Cl. 355-77.000.
Fernandes, Peter M.: *See—*
Lundblad, John L.; Warner, Willis L.; and Fernandes, Peter M., 4,186,192, Cl. 424-85.000.
Fernandez, Lazaro. Machine air pressurized game. 4,185,828, Cl. 273-142.00J.
Ferra, Antoine: *See—*
Vache, Marcel; and Ferra, Antoine, 4,185,748, Cl. 220-8.000.
Ferre, Yves: *See—*
Deabriges, Jean; Ferre, Yves; and Goumont, Claude, 4,186,004, Cl. 430-218.000.
Ferrentino, Antonio, to Industrie Pirelli Societa per Azioni. Optical fiber cable. 4,185,887, Cl. 350-96.230.
Ferrin, S. Paul: *See—*
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.
Festinori, Volfango: *See—*
Exner, Gerhard; Festinori, Volfango; and Luckschus, Detlef, 4,185,504, Cl. 73-761.000.
Exner, Gerhard; Festinori, Volfango; and Luckschus, Detlef, 4,185,505, Cl. 73-761.000.
Exner, Gerhard; Festinori, Volfango; and Luckschus, Detlef, 4,185,506, Cl. 73-761.000.
Fiat-Allis Construction Machinery, Inc.: *See—*
Danner, Bill A., 4,185,838, Cl. 277-58.000.
Fichtenbaum, Matthew L., to GenRad, Inc. Phase change detection method of and apparatus for current-tracing the location of faults on printed circuit boards and similar systems. 4,186,338, Cl. 324-52.000.
Ficker, Walter W.: *See—*
Buchmann, Albert H.; Cochran, Thomas J.; Ficker, Walter W.; Stricker, Alfred A.; and von Kaenel, Walter, 4,185,814, Cl. 271-108.000.
Field Container Corporation: *See—*
Sykora, John M.; and Pollack, Theodore W. (said John M. Sykora assors. to), 4,185,767, Cl. 229-39.00R.
Fieldcrest Mills, Inc.: *See—*
Zeigler, George E., Jr.; and Hutcherson, Henry S., 4,186,043, Cl. 156-204.000.
Finch, Walter G.: *See—*
McLean, William B., 4,185,797, Cl. 244-3.160.
Finger, Eugene P., to Curtis Instruments, Inc. Method and apparatus for measuring current, especially useful in multi-ampere systems. 4,186,339, Cl. 324-142.000.
Finsterwalder, Ulrich, to Dyckerhoff & Widmann Aktiengesellschaft. Method of and parts used in the construction of a prestressed concrete structure. 4,185,440, Cl. 52-741.000.
Fischer, Artur. Structural element and a cover member of a toy construction kit. 4,185,411, Cl. 46-23.000.
Fischer, Artur. Element for and a method of mounting an object to a support structure. 4,185,438, Cl. 52-704.000.
Fischer, Artur. Mounting element. 4,185,536, Cl. 85-83.000.
Fischer, Cathy Jo: *See—*
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.
Fischer, Edward: *See—*
Myles, J. Edgar; and Fischer, Edward, 4,185,802, Cl. 248-74.00A.
Fischer & Krecke: *See—*
Hars, Christoph; Schirrich, Klaus; Steinmeier, Bodo; and Tappe, Wilfried, 4,185,879, Cl. 308-20.000.
Fischer Sherman, Inc.: *See—*
Myles, J. Edgar; and Fischer, Edward, 4,185,802, Cl. 248-74.00A.
Fish, Ronald W., to Trico Equipment Corporation. Scarifying attachment for floor machine. 4,185,350, Cl. 15-236.00C.
Fisher, Richard C.: *See—*
Zintz, Howard; Fisher, Richard C.; and Gee, John F., 4,185,652, Cl. 137-81.000.
Fisk, Dwight; and Drew, Willis P., to Straubel Paper Company. Coil Cover. 4,185,742, Cl. 206-414.000.
Fitch, Steven J.; Peeling, Philip R.; and Heiser, David J., to SCM Corporation. Aqueous ferrous waste conversion process. 4,186,088, Cl. 210-45.000.
Fitzgibbon, Alan: *See—*
Seese, Robert G.; Fitzgibbon, Alan; and Slish, Frank, 4,185,999, Cl. 75-148.000.
Flayosc, Edmond: *See—*
Castellani, Jean-Louis; Flayosc, Edmond; and Pasternak, Jean, 4,186,375, Cl. 360-40.000.
Fleck, Raymond N., to Union Oil Company of California. Dehydration of solvent used in oil dewaxing-deoiling processes. 4,186,059, Cl. 203-14.000.
Fleischer, Donald W.; and Peruggi, Richard E., to Veeder Industries Inc. Gasoline station registration and control system. 4,186,381, Cl. 340-152.00R.
Fleiter, Lothar: *See—*
Dhein, Rolf; Fleiter, Lothar; and Beer, Wolfgang, 4,186,116, Cl. 260-23.0AR.
Flimon, Hughes J. Apparatus for the protection of tubes particularly tubes for drilling petroleum. 4,185,665, Cl. 138-89.000.
Flita, Eberhard. Heat treatment apparatus for waste containing thermoplastic material. 4,185,784, Cl. 241-66.000.
Flittie, Clifford G. Sleeper's smoke-alarm clock. 4,186,389, Cl. 340-628.000.
Flocchini, Andrew J. Milk sensor for machine remover. 4,185,586, Cl. 119-14.080.
Florens, Raymond L.; and Timmerman, Daniel M., to Agfa-Gevaert, N.V. Silver halide elements with polymers containing ketoiminoguanidinium groups. 4,186,010, Cl. 430-627.000.
Floymayr, Joachim: *See—*
Jericho, Karl; Floymayr, Joachim; Reimpell, Uwe; and Drechsel, Dieter, 4,186,173, Cl. 422-250.000.
Fluoroware, Inc.: *See—*
Milliren, Guy L., 4,185,807, Cl. 251-218.000.

FMC Corporation: *See—*
Betlinski, Glenn M., 4,185,516, Cl. 74-501.50R.
Milberger, Lionel J.; and Tucker, Albert R., 4,185,541, Cl. 91-526.000.
Sutton, William M., 4,186,091, Cl. 210-77.000.
Fogel, Sidney J.: *See—*
Katz, Jerome; and Fogel, Sidney J., 4,186,058, Cl. 203-11.000.
Katz, Jerome; and Fogel, Sidney J., 4,186,060, Cl. 203-26.000.
Fohl, Timothy, to GTE Sylvania Incorporated. Photoflash unit having lamp arrays on opposing sides. 4,186,424, Cl. 362-13.000.
Foley, Daryl J.: *See—*
Foley, Jeffery R.; and Foley, Daryl J., 4,185,881, Cl. 339-41.000.
Foley, James W., to Polaroid Corporation. Employing a 3,3 disubstituted sulfam(na)phthalein filter dye. 4,186,001, Cl. 430-220.000.
Foley, Jeffery R.; and Foley, Daryl J., to Playsafe Electrics Proprietary Limited. Electrical plug and socket arrangement. 4,185,881, Cl. 339-41.000.
Ford, Harry S., Jr.; Hamparian, Nshan; and Sihon, Tanas M., to General Motors Corporation. Engine lubricating oil pump. 4,185,717, Cl. 184-6.280.
Ford, Michael F. J.: *See—*
Sellars, Hubert D.; Mills, David; and Ford, Michael F. J., 4,186,222, Cl. 427-134.000.
Forde, Alfredo: *See—*
Forde, Louis; Forde, Alonzo C.; Forde, Gregory L.; Forde, Alfredo; and Forde, Raymond, 4,185,601, Cl. 123-146.50A.
Forde, Alonzo C.: *See—*
Forde, Louis; Forde, Alonzo C.; Forde, Gregory L.; Forde, Alfredo; and Forde, Raymond, 4,185,601, Cl. 123-146.50A.
Forde, Gregory L.: *See—*
Forde, Louis; Forde, Alonzo C.; Forde, Gregory L.; Forde, Alfredo; and Forde, Raymond, 4,185,601, Cl. 123-146.50A.
Forde, Louis; Forde, Alonzo C.; Forde, Gregory L.; Forde, Alfredo; and Forde, Raymond. Photo electric ignition system. 4,185,601, Cl. 123-146.50A.
Forde, Raymond: *See—*
Forde, Louis; Forde, Alonzo C.; Forde, Gregory L.; Forde, Alfredo; and Forde, Raymond, 4,185,601, Cl. 123-146.50A.
Forrest, John W., to Bowmari/Ali, Inc. Instrument housing. 4,186,386, Cl. 340-366.00R.
Forterre, Gerard; and Marcoux, Jean, to Societe Lignes Telegraphiques et Telephoniques. Non-reciprocal microwave phase shifters operating in a wide band on edge mode. 4,186,357, Cl. 333-24.100.
Fortunato, James M.: *See—*
Glamkowski, Edward J.; and Fortunato, James M., 4,186,199, Cl. 424-232.000.
Frank, Ralph. Transducer coupling apparatus. 4,185,502, Cl. 73-644.000.
Frank, Robert G., to PPG Industries, Inc. Apparatus for handling glass sheets during shaping and cooling. 4,185,986, Cl. 65-287.000.
Frater, Robert: *See—*
Gabbay, Shlomo; and Frater, Robert, 4,185,636, Cl. 128-334.00R.
Freedman, Bruce M. Surgical instrument. 4,185,634, Cl. 128-314.000.
Freeman, John L.; and Rose, John B., to Imperial Chemical Industries Limited. Aromatic polymers having phenylene groups linked by oxygen atoms, keto groups and sulphone groups. 4,186,262, Cl. 528-125.000.
Frick Comany: *See—*
Garland, Milton W., 4,185,467, Cl. 62-81.000.
Fridrich, Igor: *See—*
Vit, Rudy; and Fridrich, Igor, 4,185,672, Cl. 144-312.000.
Frie, Wolfgang; and Henkel, Hans-Joachim, to Siemens Aktiengesellschaft. Method for operating a reformed-gas generator. 4,185,966, Cl. 48-212.000.
Frieder, Philip M. Prosthetic aspheric spectacle lens for aphakia. 4,185,897, Cl. 351-167.000.
Friedrichsfeld GmbH. Steinzeug-und Kunststoffwerke: *See—*
Heimke, Gunther; and Schulte, Willi, 4,185,383, Cl. 433-173.000.
Frisbee, Claude M., to J. I. Case Company. Adjustable auger dozer. 4,185,698, Cl. 172-71.000.
Froehlich, Harold E., to Minnesota Mining and Manufacturing Company. Medical stapling device. 4,185,762, Cl. 227-138.000.
Frumin, Isidor I.: *See—*
Ksendzyk, Georgy V.; Frumin, Isidor I.; and Shirin, Vladimir S., 4,185,682, Cl. 164-252.000.
Fudro, Stanley J. Egg decorating device. 4,185,389, Cl. 33-21.00R.
Fuji Photo Film Co., Ltd.: *See—*
Kobayashi, Kesanao; Matsumoto, Hiroshi; and Narutomi, Yasuhisa, 4,186,006, Cl. 430-302.000.
Minagawa, Nobuhiko; and Kurabayashi, Hiroyuki, 4,186,018, Cl. 430-532.000.
Ogawa, Hiroshi; Nakamura, Matsuaki; and Tamai, Yasuo, 4,186,228, Cl. 428-413.000.
Fujimoto, Masanori; Fukami, Kosuke; Tsuji, Kozo; and Nagase, Tsuneyuki, to Sumitomo Chemical Company, Limited; and Hayashibara Biochemical Laboratories, Inc. Method for improving water-resistance of pullulan. 4,186,024, Cl. 106-162.000.
Fujioka, Yasuo: *See—*
Tanahashi, Toshio; and Fujioka, Yasuo, 4,185,463, Cl. 60-322.000.
Fujita, Masanori; and Oda, Hajime, to Kabushiki Kaisha Seikosha. Method of driving a liquid crystal display apparatus. 4,186,395, Cl. 340-765.000.
Fujitsu Ten Limited: *See—*
Takayama, Kazuo, 4,186,350, Cl. 325-383.000.
Fukami, Kosuke: *See—*
Fujimoto, Masanori; Fukami, Kosuke; Tsuji, Kozo; and Nagase, Tsuneyuki, 4,186,024, Cl. 106-162.000.
Fun, Fay: *See—*
Brayton, William E.; Fun, Fay; Hendrickson, Luther G.; and Shoenberger, Ronald W., 4,186,054, Cl. 201-6.000.
Furukawa, Toshio: *See—*
Agui, Wataru; Higosaki, Nobuyuki; Yamanari, Koichiro; Furukawa, Toshio; and Kuyama, Hiroshi, 4,186,167, Cl. 264-141.000.
Gaafar, Hassan A.; and D'Arcangelis, Dora, to Research Corporation. Serological test for *Neisseria gonorrhoeae* antibodies. 4,186,182, Cl. 424-1.000.
Gabbay, Shlomo; and Frater, Robert, to Albert Einstein College of Medicine of Yeshiva University. Suture organizer, prosthetic device holder, and related surgical procedures. 4,185,636, Cl. 128-334.00R.
Gajdos, Leslie B.: *See—*
Brodine, Walter E.; and Gajdos, Leslie B., 4,185,584, Cl. 116-272.000.
Gall, John C.; Batogowski, Joseph H.; and Chamberlain, Albert F., to Sears, Roebuck and Co. Typewriter with instructional apparatus. 4,185,400, Cl. 35-5.000.
Gangal, Subhash V., to Du Pont de Nemours, E. I., and Company. Process for obtaining colloidal dispersion of polymeric tetrafluoroethylene. 4,186,121, Cl. 260-29.60F.
Gantts, Vitaly L.; Krupenin, Nikolai V.; Meschanov, Gennady I.; and Peshkov, Izyaslav B. Method and device for insulating covering of cables. 4,186,041, Cl. 156-53.000.
Ganz, Frederick M.: *See—*
Cermignani, Justine D.; and Ganz, Frederick M., 4,186,400, Cl. 343-708.000.
Garland, Milton W., to Frick Comany. Icemaker liquid refrigerant defrost system. 4,185,467, Cl. 62-81.000.
Garner, Robert; and Petitpierre, Jean C., to Ciba-Geigy Corporation. 3-Indolyl-3-phenyl-phthalides. 4,186,134, Cl. 260-326.13H.
Garrett, Walter L.; and Czerepinski, Ralph G., to Dow Chemical Company, The. Method of desensitizing image-bearing lithographic plates. 4,186,250, Cl. 96-33.000.
Gartung, Clifford W., to Pleion Corporation. Interconnecting modular screen assembly. 4,185,430, Cl. 52-285.000.
Gary, Bette M.: *See—*
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.
Gassman, Paul G.; and Cue, Berkeley W., to University of Minnesota, The Regents of the. Isatin products. 4,186,132, Cl. 260-325.00R.
Gatewood, Sidney U., to Borg-Warner Corporation. Clutch disc with variable deflection rate vibration damper. 4,185,728, Cl. 192-106.200.
Gatos, Harry C.; and Jastrzebski, Lubomir L., to Massachusetts Institute of Technology. Method of epitaxial growth employing electromigration. 4,186,045, Cl. 156-602.000.
Gazzara, Charles P.: *See—*
DeLai, A. Joseph; and Gazzara, Charles P., 4,186,046, Cl. 156-605.000.
Gazzoni, Domenico, to Sorema S.r.l. Tapered-end silo, especially for small-sized plastics material. 4,185,925, Cl. 366-69.000.
Gebr. Claas Maschinenfabrik GmbH: *See—*
Clostermeyer, Gerhard; and Jaross, Heinz, 4,185,446, Cl. 56-344.000.
Gee, John F.: *See—*
Zintz, Howard; Fisher, Richard C.; and Gee, John F., 4,185,652, Cl. 137-81.000.
Geise, Howard F., to Sealer Air Corporation. Process and apparatus for mixing viscous liquids. 4,186,256, Cl. 521-155.000.
Geiseler, Wolfgang, to CMB Colonia Management-und Beratungsgesellschaft mbH & Co. KG. Method and apparatus for restoring aged sound recordings. 4,186,280, Cl. 179-100.10R.
Gelenkwellenbau GmbH: *See—*
Kleinschmidt, Hans-Joachim; and Faulbecker, Gerd, 4,185,475, Cl. 64-21.000.
General Atomic Company: *See—*
Thomas, Harold A., 4,186,048, Cl. 176-19.00J.
West, Gordon B.; and Peters, Ralph H., 4,186,050, Cl. 176-62.000.
General Binding Corporation: *See—*
Giulie, Joe D., 4,185,405, Cl. 40-2.200.
General Dynamics Corporation: *See—*
Holland, Charles L.; and Nicoloff, George B., 4,185,373, Cl. 29-423.000.
General Electric Company: *See—*
Anderson, Bernard J., 4,185,937, Cl. 403-316.000.
Anderson, Wesley K., 4,186,318, Cl. 310-68.00C.
Baldwin, Samuel L., 4,186,433, Cl. 362-263.000.
Darrow, Kenneth A.; and Pagnotta, Gasper, 4,185,369, Cl. 29-156.80B.
Dochterman, Richard W., 4,186,319, Cl. 310-89.000.
Grahame, Frederick W., 4,186,417, Cl. 361-15.000.
Hall, Walter L.; and Humphrey, James S., Jr., 4,186,221, Cl. 427-45.000.
Hueschen, Robert E.; and Jens, Richard A., 4,185,365, Cl. 29-25.150.
Marshall, Robert A., 4,186,321, Cl. 310-178.000.
Maucione, Carl M., 4,186,038, Cl. 148-113.000.
Miller, William M., 4,185,414, Cl. 47-62.000.
Morse, Robert A., II; and Rondina, Alfred J., Jr., 4,185,462, Cl. 60-261.000.
Palmer, Ansell W.; and Stevens, Francis J., 4,185,722, Cl. 192-18.00B.
Savkar, Sudhir D., 4,185,455, Cl. 60-39.060.

Scott, Allen W., 4,186,287, Cl. 200-61.620.
Sugalski, Raymond K., 4,186,246, Cl. 429-60.000.
Winter, Alfons M.; Paternoster, Nicholas L.; and Pasko, Walter J., 4,185,688, Cl. 165-122.000.
General Foods, Limited: *See*—
Geraedts, Joseph G., 4,185,763, Cl. 229-15.000.
General Motors Corporation: *See*—
Boltz, Hartmann, 4,185,518, Cl. 74-516.000.
deBuhr, Alfred P.; Meyer, Bruce R.; and Wilson, Robert J., 4,186,331, Cl. 318-52.000.
Ford, Harry S., Jr.; Hamparian, Nshan; and Sihon, Tanas M., 4,185,717, Cl. 184-6.280.
Karklins, Elgin J.; and Oliver, Michael L., 4,185,721, Cl. 188-322.000.
Kitchin, Oscar G., 4,185,724, Cl. 192-45.000.
Kuo, Wey-Chaung; and Hsu, Hwei P., 4,186,286, Cl. 200-19.0DR.
Lo, Wayne, 4,186,355, Cl. 331-94.50H.
Maina, Mario J., 4,185,725, Cl. 192-53.00F.
Salamon, Theodore M., 4,185,855, Cl. 280-804.000.
Thornburgh, William F., 4,185,607, Cl. 123-198.00F.
General Products Company, Inc.: *See*—
McKann, H. Smith, 4,185,417, Cl. 49-470.000.
General Scanning Inc.: *See*—
Montagu, Jean I., 4,186,332, Cl. 318-128.000.
General Signal Corporation: *See*—
Schwab, Carl E.; and Hutter, Joseph A., 4,186,399, Cl. 343-102.000.
GenRad, Inc.: *See*—
Fichtenbaum, Matthew L., 4,186,338, Cl. 324-52.000.
Gentile, Giulio. Device for externally exerting a holding action on bone tissues. 4,185,624, Cl. 128-92.00A.
Gentry, Cara M.: *See*—
Brock, James E.; Gentry, Cara M.; and DeUnger, Ray, 4,185,348, Cl. 15-101.000.
George, Robert W., to National Can Corporation. Apparatus for forming tamper-proof closures. 4,185,576, Cl. 113-1.00D.
George Salter & Company, Limited: *See*—
Bache, John K.; Sanderson, Albert M.; and Pearson, Arthur, 4,186,039, Cl. 148-128.000.
Georgia-Pacific Corporation: *See*—
Holmquist, Howard W., 4,186,242, Cl. 428-528.000.
Geraedts, Joseph G., to General Foods, Limited. Container with overwrap. 4,185,763, Cl. 229-15.000.
Gerard, Jean-Pierre: *See*—
Pujol, Jean-Claude; Gerard, Jean-Pierre; Madec, Paul; and Metaut, Daniel, 4,185,580, Cl. 114-321.000.
Gerber, Hans; Grueninger, Erwin; Koch, Werner; and Somm, Franz, to Sandoz Ltd. Dyeing with organic dyestuffs dispersed in an organic liquid. 4,185,962, Cl. 8-171.000.
Gerber, Hans: *See*—
Canela, Jose; and Gerber, Hans, 4,186,119, Cl. 260-29.2TN.
Germain, Alfred M. J., to Union Siderurgique du Nord et de l'Est de la France, "USINOR". Machine for treating sheets of variable width. 4,185,648, Cl. 134-122.00R.
Germain, Alfred M. J., to Union Siderurgique du Nord et de l'Est de la France, "USINOR". Arrangement of the input and output ends of a metal sheet cooling machine. 4,185,649, Cl. 134-122.00R.
Gerrish, Howard W., Jr., to United States of America, Navy. Stress reducing liner and method of fabrication. 4,185,557, Cl. 102-103.000.
Gewerkschaft Eisenhutte Westfalia: *See*—
Beckmann, Klaus, 4,185,874, Cl. 299-32.000.
Giammarco, Giuseppe; and Giammarco, Paolo. Process for the production of hydrogen. 4,186,181, Cl. 423-650.000.
Giammarco, Paolo: *See*—
Giammarco, Giuseppe; and Giammarco, Paolo, 4,186,181, Cl. 423-650.000.
Giannone, Victor S. Vehicle tire chain structure. 4,185,674, Cl. 152-218.000.
Gibbs, Dale S., to Dow Chemical Company, The. Crystallizable vinylidene chloride polymer powders and acrylic fibers containing same. 4,186,156, Cl. 529-78.000.
Giberson, Elwood C. Waste heat recovery system and method. 4,185,685, Cl. 165-1.000.
Gibson, Keith R.: *See*—
Bell, David G.; and Gibson, Keith R., 4,186,027, Cl. 106-288.00B.
Giggard, Earl D., to Continental Group, Inc., The. Compartmentalized aerosol container. 4,185,758, Cl. 222-386.500.
Gilbert, Harold J., to Wickman Machine Tool Sales Ltd. Spindle drives for multi spindle lathes. 4,185,366, Cl. 29-35.500.
Gill, Arthur W.; Loup, Ronald L.; and Day, Curtis H., to Double A Products. Solenoid operated directional valve with detent mechanism. 4,185,661, Cl. 137-625.650.
Gill, John G.; and Hemens, James F., to Teleflex Morse Limited. Control devices. 4,185,517, Cl. 74-512.000.
Gill, Stephen H., to Caterpillar Tractor Co. Cylinder mounting. 4,185,945, Cl. 414-727.000.
Gillette Company, The: *See*—
Crouse, Vernon J., III; and Farmer, Robert F., III, 4,186,214, Cl. 426-3.000.
Gilman, John J., to Allied Chemical Corporation. Energy storage flywheel. 4,186,245, Cl. 428-635.000.
Gilmour, James, to May & Baker Limited. Imidazole derivatives. 4,185,992, Cl. 71-92.000.
Gingras, Joel A., Sr.; Heffernan, William R.; Vega, Mary-Louise; and Beachem, Michael T., to American Cyanamid Company. Emergency lighting device. 4,186,426, Cl. 362-34.000.
Ginn, Wayne M.: *See*—
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; Benkoe, Elisabeth, executrix; Dantzer, Elonne; La Dow, William R.; Ginn, Wayne M.; and Dyson, L. Ray, 4,185,413, Cl. 46-118.000.
Gipp, Roland: *See*—
Blahak, Johannes; Gipp, Roland; Wagner, Kuno; Muller, Erwin; Mazanek, Jan; and Haas, Peter, 4,186,257, Cl. 521-159.000.
Girard-Perregaux S.A.: *See*—
Besson, Francis, 4,186,322, Cl. 310-194.000.
Girling Limited: *See*—
Op den Camp, Lutz E. A., 4,185,750, Cl. 220-20.500.
Giuffre, Luigi: *See*—
de Nora, Oronzio; Giuffre, Luigi; and Modica, Giovanni, 4,186,076, Cl. 204-295.000.
Giulie, Joe D., to General Binding Corporation. Prefabricated laminating packet with tab. 4,185,405, Cl. 40-2.200.
Givaudan Corporation: *See*—
Krasnobajew, Victor; and Boeniger, Regula, 4,186,053, Cl. 435-180.000.
Gkn-Stenman AB: *See*—
Tranberg, Erik R.; and Widen, Bo G., 4,185,481, Cl. 70-379.00R.
Gladish, Herbert E., to E.B. Eddy Forest Products, Ltd. Doctor blade, drying or sealing assembly. 4,185,399, Cl. 34-120.000.
Glamkowski, Edward J.; and Fortunato, James M., to American Hoechst Corporation. Indolo-,1,2-dihydroindolo-, and 1,2,6,7-tetrahydroindolo [1,7-ab][1,5] benzodiazepines. 4,186,199, Cl. 424-232.000.
Glaser, Hermann: *See*—
Vogt, Wilhelm; Koch, Jurgen; and Glaser, Hermann, 4,186,112, Cl. 252-471.000.
Gnuechtel, Herman C., to Web Printing Controls Co. Inc.,. Web monitoring and control apparatus for web handling machinery. 4,186,309, Cl. 250-561.000.
Godai, Tomokazu; Takeuchi, Yasuhito; Nakai, Kozo; Takeuchi, Kazuo; and Morioka, Yoshihisa, to Kobe Steel Limited. Surface flaw detector. 4,185,921, Cl. 356-426.000.
Goetze AG: *See*—
Beyer, Horst; Buran, Ulrich; and Neuhauser, Hans-Joachim, 4,185,843, Cl. 277-224.000.
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; by Benkoe, Elisabeth, executrix; Dantzer, Elonne; La Dow, William R.; Ginn, Wayne M.; and Dyson, L. Ray, to Goldfarb, Adolph E.; and Benkoe, Elisabeth, Executrix for the Estate of Erwin Benkoe. Toy milkable animal figure. 4,185,413, Cl. 46-118.000.
Gomi, Teruo; Hisa, Yuji; and Soeda, Takahiko, to Ajinomoto Company, Incorporated. Process for preparing improved soy protein materials. 4,186,218, Cl. 426-598.000.
Goncalves, Antonin L., to L'Oreal. Bottle stopper with inviolability device. 4,185,747, Cl. 215-253.000.
Gonzalez, John; Young, Ronald F.; and Amata, Mario A., to Lincoln Electric Company, The. Cored type welding electrode. 4,186,293, Cl. 219-146.240.
Goodyear Tire & Rubber Company, The: *See*—
Sinclair, Edward A.; and Kalbfleisch, John M., 4,186,230, Cl. 428-95.000.
Gordy, Robert S.; Chambers, Ramon P.; and Sanders, David E., to E-Systems, Inc. Adaptive narrow band noise estimator/suppressor radio receiver. 4,186,349, Cl. 325-323.000.
Gorille, Ingo: *See*—
Sohner, Gerhard; Hohne, Gerd; Werner, Peter; Gorille, Ingo; and Roozenbeek, Herman, 4,185,603, Cl. 123-148.00E.
Gould Inc.: *See*—
Tisone, Thomas C.; and Bolker, Barry F. T., 4,185,496, Cl. 73-141.00A.
Goumont, Claude: *See*—
Deabriges, Jean; Ferre, Yves; and Goumont, Claude, 4,186,004, Cl. 430-218.000.
Grace, Henry C.: *See*—
Davis, Jay P.; Grace, Henry C.; and Nabors, James B., 4,186,265, Cl. 544-204.000.
Graham, Douglas L., to Solarcrete Corporation. Flowable material pump apparatus. 4,185,924, Cl. 366-10.000.
Graham Magnetics Inc.: *See*—
Deffeyes, Robert J.; and Armstrong, Harris W., 4,186,244, Cl. 428-570.000.
Grahame, Frederick W., to General Electric Company. Capacitor protective system. 4,186,417, Cl. 361-15.000.
Graphic Controls Corporation: *See*—
Pelensky, Joseph; and Erdman Charles A., 4,186,405, Cl. 346-140.00A.
Graveno, John C. Sight and vision protection for arc welding helmet. 4,185,328, Cl. 2-8.000.
Green Cross Corporation, The: *See*—
Yokoyama, Kazumasa; Iwai, Masakazu; Okamoto, Hiroyuki; and Yamada, Noboru, 4,186,253, Cl. 435-240.000.
Greene, Jerome. Fluid seal with lubricated sealing surfaces. 4,185,837, Cl. 277-27.000.
Gregory, John B., to United States of America, Navy. Method of treating burns using a poly-ε-caprolactone. 4,186,190, Cl. 424-78.000.
Greiner, Henri; and Lefaucheur, Claude A., to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes. Vehicle tires. 4,185,675, Cl. 152-354.00R.
Grillo, Thomas A., to J. M. Huber Corporation. Record member and encapsulated clay for use therein. 4,186,224, Cl. 427-221.000.
Grinberg, Valentin A.: *See*—
Zabava, Jury G.; Kogan, Rem N.; Lurie, Dzhan A.; Surkov, Viktor G.; Bratslavskaya, Elvira A.; Barabash, Ivan M.; Rodnyanksy,

Ilya G.; Maljukyavichjus, Antanas A.; Voitenko, Egor T.; Anisovich, Gennady A.; Bevza, Vladimir F.; Tutov, Vadim I.; Grinberg, Valentin A.; Marukovich, Evgeny I.; and Senkin, Nikolai A., 4,185,684, Cl. 164-263.000.

Groen, Marinus B.: *See—*
Zeelen, Filippus J.; and Groen, Marinus B., 4,186,142, Cl. 260-397.500.

Grollier, Jean-Francois: *See—*
Bugaut, Andree; Grollier, Jean-Francois; and Vandenboosche, Jean-Jacques, 4,185,958, Cl. 8-10.100.

Grossniklaus, Hans. Wood-fired furnace assembly with automatic fire chamber charger. 4,185,567, Cl. 110-101.00R.

Grote & Hartmann GmbH & Co. KG: *See—*
Reinertz, Rudolf; and Born, Wolfgang, 4,185,522, Cl. 81-9.510.

Grow Chemical Corp.: *See—*
Tsou, Ivan H., 4,186,117, Cl. 260-23.0AR.

Grubb, Daniel: *See—*
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.

Gruber, Wolfgang: *See—*
Roder, Albert; Mollering, Hans; Gruber, Wolfgang; Beaucamp, Klaus; Seidel, Hans; Stahl, Peter; and von Hoerschelmann, Detlef, 4,186,052, Cl. 435-28.000.

Grueninger, Erwin: *See—*
Gerber, Hans; Grueninger, Erwin; Koch, Werner; and Somm, Franz, 4,185,962, Cl. 8-171.000.

Grumman Aerospace Corporation: *See—*
Cermignani, Justine D.; and Ganz, Frederick M., 4,186,400, Cl. 343-708.000.
Kaestner, Paul, 4,185,891, Cl. 350-167.000.
Muntz, Eric P., 4,185,466, Cl. 62-55.500.

GTE Automatic Electric Laboratories Incorporated: *See—*
Burns, Robert V., 4,186,275, Cl. 179-6.30R.

GTE Sylvania Incorporated: *See—*
Brefini, Gary P.; and Stites, Francis H., 4,186,351, Cl. 325-398.000.
Fohl, Timothy, 4,186,424, Cl. 362-13.000.

Gudzin, Martin G., to Teledyne Industries, Inc. Cable supported piezoelectric bender intrusion detector array. 4,186,325, Cl. 310-331.000.

Guenther, Gerd J., to Siemens Aktiengesellschaft. Circuit arrangement for determining the position of a printer carriage in printer devices. 4,185,931, Cl. 400-705.000.

Guerber, Paul L., to Coyne & Bellier, Bureau d' ingenieurs Conseils. Apparatus for producing deep boreholes. 4,185,703, Cl. 175-17.000.

Gueret, Pierre: *See—*
Baechtold, Werner; and Gueret, Pierre, 4,186,441, Cl. 365-160.000.

Guillemette, Rejean. Photographic enlargement and development apparatus. 4,185,911, Cl. 355-27.000.

Guinot, Michel: *See—*
Kistler, Jean P.; and Guinot, Michel, 4,185,988, Cl. 71-27.000.

Gulf Oil: *See—*
Kvapil, Rudolph; and Clews, K. Malcolm, 4,185,871, Cl. 299-2.000.

Gumprecht, Janet A.; and Redken Laboratories, Inc. Treating hair with cosmetic formulations containing polypeptides. 4,186,188, Cl. 424-70.000.

Guse, Kuno: *See—*
Bohnes, Karlheinz; and Guse, Kuno, 4,185,873, Cl. 299-31.000.

Gutierrez, Enrique H., to Systems Concept, Inc. Lightweight building module. 4,185,423, Cl. 52-79.900.

Guyot, Pierre; Delfau, Paul; and Amaury, Robert, to Ifelec, Societe Anonyme. Tracing table. 4,186,404, Cl. 346-29.000.

H. Koch & Sons Division (Gulf & Western Mfg. Co.): *See—*
David, Nicholas F., 4,185,363, Cl. 24-230.00A.

Haas, Peter: *See—*
Blahak, Johannes; Gipp, Roland; Wagner, Kuno; Muller, Erwin; Mazanek, Jan; and Haas, Peter, 4,186,257, Cl. 521-159.000.

Habault, Robert: *See—*
Barbe, Gerard; and Habault, Robert, 4,186,168, Cl. 264-168.000.

Haberlin, Richard J.; and Stephens, Robert K., to Polaroid Corporation. Photographic products and processes employing roll film with acid backing layer. 4,186,005, Cl. 430-228.000.

Habib, Edward T., Jr., to Mobil Oil Corporation. In-situ leaching of uranium. 4,185,872, Cl. 299-4.000.

Hackenberg, Robert A.: *See—*
Davidson, Thomas L.; and Hackenberg, Robert A., 4,185,766, Cl. 229-39.00B.

Hagihara, Bunji. Oxygen measuring electrode assembly. 4,185,620, Cl. 128-635.000.

Hahn, Hans: *See—*
Baier, Erich; and Hahn, Hans, 4,185,907, Cl. 355-3.00R.

Hainsworth, William A.: *See—*
Bradley, Robert J.; and Hainsworth, William A., 4,186,044, Cl. 156-273.000.

Haisser, Alan S., to Sterling Extruder Corporation. Apparatus for cooling rubber and plastic extrudates. 4,185,396, Cl. 34-57.00R.

Halisek, Frank C.: *See—*
Areaux, Larry D.; and Halisek, Frank C., 4,186,096, Cl. 210-377.000.
Dudley, Robert H.; and Halisek, Frank C., 4,186,097, Cl. 210-377.000.

Hall, Adrian B., to Cincinnati Milacron Inc. Blow molding pallet assembly for conveying one or more workpieces. 4,185,812, Cl. 269-56.000.

Hall, Charles M.; and Wright, John B., to Upjohn Company, The. N-Hetero substituted dioxamic acid compounds. 4,186,127, Cl. 260-239.00B.

Hall, Gail M.: *See—*
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.

Hall, Gary: *See—*
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.

Hall, John B.; Hruza, Denis E., Sr.; Shuster, Edward J.; Vock, Manfred H.; and Vinals, Joaquin F., to International Flavors & Fragrances Inc. Use of spiropyran derivatives in augmenting, enhancing or modifying the aroma of detergents. 4,186,103, Cl. 252-174.110.

Hall, John B.: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,186,150, Cl. 260-586.00G.

Hall, Philip: *See—*
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.

Hall, Ray R.: *See—*
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.

Hall, Walter L.; and Humphrey, James S., Jr., to General Electric Company. Method of applying glass layers to polycarbonate. 4,186,221, Cl. 427-45.000.

Hall, Wilbur S., to Union Carbide Corporation. Maintaining the effectiveness of a coating composition. 4,186,219, Cl. 427-8.000.

Hallford, Ben R., to Rockwell International Corporation. Signal converter apparatus. 4,186,352, Cl. 325-446.000.

Halliburton Company: *See—*
Farris, Richard C.; and Butler, William S., 4,185,719, Cl. 188-33.000.
Harris, Allen E., 4,185,689, Cl. 166-133.000.

Ham, William E., to RCA Corporation. Method for cleaning and drying semiconductors. 4,186,032, Cl. 134-31.000.

Hamacher, Martin. Lamp for use in subterranean applications. 4,186,432, Cl. 362-226.000.

Hammond, Theodore A. Powered pan conveyor. 4,185,735, Cl. 198-789.000.

Hammonds, James C.: *See—*
Stoller, Patricia S.; Hammonds, James C.; Kloepper, John O.; and Schlobohm, Arnold, 4,185,564, Cl. 410-64.000.

Hamparian, Nshan: *See—*
Ford, Harry S., Jr.; Hamparian, Nshan; and Sihon, Tanas M., 4,185,717, Cl. 184-6.280.

Hanaoka, Naohiro, to Olympus Optical Limited. Method of magnetizing erasing head. 4,186,364, Cl. 335-284.000.

Hancock, Reginald P. Temporary footwear for hoofed animals. 4,185,695, Cl. 168-18.000.

Hancock, William L., to Hoover Universal, Inc. Process for coating a wire spring and evaluating previous heat treat of said wire spring. 4,186,223, Cl. 427-185.000.

Hanna Mining Company, The: *See—*
Zambrano, Adolfo R., 4,185,996, Cl. 75-2.000.

Hans Sickinger Co.: *See—*
Harbert, Larry M., 4,185,668, Cl. 140-92.400.

Hansen, Charles M., Jr.: *See—*
Wang, Shou-I; and Hansen, Charles M., Jr., 4,186,391, Cl. 340-645.000.

Harbert, Larry M., to Hans Sickinger Co. Method and means for inserting, cutting and binding spiral wire binders. 4,185,668, Cl. 140-92.400.

Hardgrove, William H. Snow removal and transport device. 4,185,403, Cl. 37-53.000.

Hardin, William A.: *See—*
Waclawik, Francis J.; Muzaca, James P.; Cook, Robert A.; Hardin, William A.; Silvia, Alfred D.; and Correia, Ronald, 4,185,345, Cl. 9-8.00R.

Hardt, Peter J. Motion change transmission. 4,185,508, Cl. 74-53.000.

Harris, Allen E., to Halliburton Company. Casing bridge plug with push-out pressure equalizer valve. 4,185,689, Cl. 166-133.000.

Harris Hatchery: *See—*
Niccols, Paul L., 4,185,359, Cl. 17-51.000.

Harris, Joseph R. Pet feeding apparatus. 4,185,588, Cl. 119-51.120.

Harris, William J. Device for inserting syringe. 4,185,627, Cl. 128-215.000.

Harrison, Roger G.; Jamieson, William B.; Ross, William J.; and Saunders, John C., to Eli Lilly and Company; and Lilly Industries Limited. Acylamino derivatives. 4,186,204, Cl. 424-269.000.

Hars, Christoph; Schirrich, Klaus; Steinmeier, Bodo; and Tappe, Wilfried, to Fischer & Krecke. Shaft-supporting means, especially for printing apparatus. 4,185,879, Cl. 308-20.000.

Harter, Joseph W., III; and Beitzel, Stuart W., to 0-3 Company. Method for treating a fluid by electron emission. 4,186,070, Cl. 204-176.000.

Hartley, Larry W. Inflatable hopping game device. 4,185,819, Cl. 273-1.00A.

Hartung, Kuhn & Co. Maschinenfabrik GmbH: *See—*
Schulte, Fritz; and Riecker, Johann G., 4,186,057, Cl. 202-263.000.

Hartzell, Robert E., Jr., to Schaevitz Engineering. Linear accelerometer with piezoelectric suspension. 4,186,324, Cl. 310-329.000.

Hashimoto, Masami: *See—*
Wada, Mitsuyoshi; Hashimoto, Masami; and Nakahara, Teruo, 4,185,662, Cl. 137-636.000.

Hass, Hans-Jurger: *See—*
Wulff, Helmut; and Hass, Hans-Jurgen, 4,186,227, Cl. 427-388.00A.

Hassis, Carl H.: *See—*
Aron, Gunter; and Hassis, Carl H., 4,186,040, Cl. 149-19.400.

Hata, Masayasu: *See—*
Higuchi, Michio; and Hata, Masayasu, 4,186,344, Cl. 325-20.000.

Hatcher, Charles S.; and Smith, Kenneth E., to Phillips Petroleum Company. Apparatus and process suitable for twist-drawing a yarn. 4,185,451, Cl. 57-310.000.

Hatori, Yukiyoshi; and Katayose, Shinji, to Nissan Motor Company, Limited. Suspended driving railway car. 4,185,562, Cl. 105-152.000.

Hattori, Hiroyuki: *See—*
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,185,909, Cl. 355-15.000.

Hauk, Ernest D.: *See—*
Hauk, Thomas D.; and Hauk, Ernest D., 4,185,492, Cl. 73-46.000.

Hauk, Thomas D.; and Hauk, Ernest D. Leak testing apparatus and improved seals therefor. 4,185,492, Cl. 73-46.000.

Hauni-Werke Korber & Co. KG.: *See—*
Heitmann, Uwe; Steiniger, Wolfgang; Pfannmuller, Joachim; Lorenzen, Heinz-Christen; Koch, Franz-Peter; and Lange, Norbert, 4,185,644, Cl. 131-109.00R.

Hautau, Charles F., to Ameco Corporation. Drilling and tapping machining apparatus. 4,185,943, Cl. 408-46.000.

Hayashi, Hisao, to Kabushiki Kaisha Kawaguchiya Hayashi. Trigger device for automatic gun. 4,185,537, Cl. 89-145.000.

Hayashi, Nobuyuki: *See—*
Okada, Yasunori; Osada, Yuichi; Nakano, Mineo; Kasai, Shozo; Tachiki, Shigeo; Hayashi, Nobuyuki; and Abo, Masahiro, 4,186,122, Cl. 260-31.40R.

Hayashibara Biochemical Laboratories, Inc.: *See—*
Fujimoto, Masanori; Fukami, Kosuke; Tsuji, Kozo; and Nagase, Tsuneyuki, 4,186,024, Cl. 106-162.000.

Hays, Kenneth S.; and Lawson, Gustaf R., to AMP Incorporated. Ratchet mechanism for hand tools. 4,185,519, Cl. 74-577.00S.

Hayt, Lester J., Jr.: *See—*
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.

Hayt, Lester J., Sr.: *See—*
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.

Hayt, Nancy J.: *See—*
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.

Hebert, Donald G., to Falk, Helmut; and Hebert, Donald G. Wire matrix print head assembly. 4,185,929, Cl. 400-124.000.

Heffernan, William R.: *See—*
Gingras, Joel A., Sr.; Heffernan, William R.; Vega, Mary-Louise; and Beachem, Michael T., 4,186,426, Cl. 362-34.000.

Heikinheimo, Lennart O., to Plan-Sell Oy. Transferring and assorting apparatus for sawn timber. 4,185,733, Cl. 198-477.000.

Heimke, Gunther; and Schulte, Willi, to Friedrichsfeld GmbH. Steinzeug-und Kunststoffwerke. Dental implant having a biocompatible surface. 4,185,383, Cl. 433-173.000.

Heiniger, Kurt, to Staeubli Ltd. Adjusting device in the connecting path between a shed-forming device and a heddle frame. 4,185,666, Cl. 139-82.000.

Heiser, David J.: *See—*
Fitch, Steven J.; Peeling, Philip R.; and Heiser, David J., 4,186,088, Cl. 210-45.000.

Heitmann, Glenn A., to Johns-Manville Corporation. Pinhole free asphalt coating for a fibrous mat and process for making the same through use of a thixotropic asphalt emulsion. 4,186,236, Cl. 428-291.000.

Heitmann, Uwe; Steiniger, Wolfgang; Pfannmuller, Joachim; Lorenzen, Heinz-Christen; Koch, Franz-Peter; and Lange, Norbert, to Hauni-Werke Korber & Co. KG. Distributor for cigarette makers or the like. 4,185,644, Cl. 131-109.00R.

Hellberg, Enar V., to Swemac S.A. Apparatus for eliminating by flotation impurities in the form of solid particles contained in a liquid. 4,186,094, Cl. 210-221.00P.

Heller, Harold G.; Waterworth, Peter; and Hurditch, Rodney J. Photochromic compounds for hologram recording. 4,186,002, Cl. 430-1.000.

Helling, Gunter: *See—*
Bergthaller, Peter; von Bonin, Wulf; Helling, Gunter; and Marx, Paul, 4,186,014, Cl. 430-213.000.

Hemens, James F.: *See—*
Gill, John G.; and Hemens, James F., 4,185,517, Cl. 74-512.000.

Hempel, Rodney A.: *See—*
Briner, Clifton F.; and Hempel, Rodney A., 4,185,612, Cl. 126-122.000.

Hendrickson, Luther G.: *See—*
Brayton, William E.; Fun, Fay; Hendrickson, Luther G.; and Shoenberger, Ronald W., 4,186,054, Cl. 201-6.000.

Henke, Arthur W.: *See—*
Sargent, Frank T.; Antos, John M.; Henke, Arthur W.; Embach, James T.; Butler, Frederick A.; and Lindsay, Erin J., 4,185,337, Cl. 4-300.000.
Sargent, Frank T.; Henke, Arthur W.; Antos, John M.; and Cameron, John T., 4,185,340, Cl. 4-441.000.

Henkel, Hans-Joachim: *See—*
Frie, Wolfgang; and Henkel, Hans-Joachim, 4,185,966, Cl. 48-212.000.

Henkel Kommanditgesellschaft Auf Aktien: *See—*
Zeidler, Ulrich; and Scheuermann, Fanny, 4,186,207, Cl. 424-284.000.

Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA): *See—*
Tesmann, Holger; Weinrich, Erwin; and Lieske, Edgar, 4,186,186, Cl. 424-62.000.

Henneman, Richard C.; Burdon, Kenneth A.; and Bruce, Joseph R., to PACCAR Inc. Method and apparatus for controlling speed and direction of a vehicular towing winch and improvements in a towing winch. 4,185,520, Cl. 74-750.00R.

Henschel, Arthur O., Jr.; and McCracken, Lurin K., to All Services Enterprises, Inc. Filter assembly with paper cartridge. 4,186,099, Cl. 210-457.000.

Hensley, Edgar: *See—*
Meinerding, Wesley C.; and Hensley, Edgar, 4,185,577, Cl. 114-230.000.

Hercules Incorporated: *See—*
Wagner, Kalus P., 4,186,107, Cl. 252-429.00B.

Herr, John: *See—*
Brown, Jack; Herr, John; Peterson, Wesley R.; and Wurst, John W., 4,185,575, Cl. 112-277.000.

Hertz, Daniel L., Jr., to Seals Eastern Inc. Multilayer seal. 4,185,840, Cl. 277-125.000.

Hester, Delta R. Portable airless spraying device. 4,185,775, Cl. 239-308.000.

Heuck, Claus-Christian. Method for determining lipids in blood serum. 4,185,963, Cl. 23-230.00B.

Hewitt, Malcolm, to British Industrial Plastics Ltd. Moulding machines. 4,185,952, Cl. 425-149.000.

Hewlett-Packard Company: *See—*
Clouser, David E.; and Craven, John S., 4,185,490, Cl. 73-23.100.
Knoblock, Daryl E.; and Carey, Kenneth O., 4,186,379, Cl. 340-146.10R.
Minior, Thaddeus G.; and Tykulsky, Alexander, 4,185,641, Cl. 128-675.000.

Hibi, Kunio: *See—*
Noguchi, Koichi; and Hibi, Kunio, 4,186,341, Cl. 324-236.000.

Hiester, Kenneth R., to Shop-Vac Corporation. Integral filter cage and lid for cannister type vacuum cleaner. 4,185,974, Cl. 55-216.000.

Higasa, Tadashi: *See—*
Shiga, Shujiro; Katsumata, Takeshi; Okamoto, Yasushi; and Higasa, Tadashi, 4,186,177, Cl. 423-239.000.

Hight, Henry D., Jr., to Martin Concrete Engineering Company. Method for producing concrete panel having fractured rib finish. 4,186,166, Cl. 264-139.000.

Higosaki, Nobuyuki: *See—*
Agui, Wataru; Higosaki, Nobuyuki; Yamanari, Koichiro; Furukawa, Toshio; and Kuyama, Hiroshi, 4,186,167, Cl. 264-141.000.

Higuchi, Michio; and Hata, Masayasu, to Oki Electric Industry Co., Ltd. Frequency converter. 4,186,344, Cl. 325-20.000.

Hikosaka, Tatsuya: *See—*
Nakaso, Tohru; Hosokawa, Manabu; Nomura, Kenzi; and Hikosaka, Tatsuya, 4,185,377, Cl. 29-568.000.

Hilge, Bernhard: *See—*
Eichenberger, Walter; and Hilge, Bernhard, 4,185,810, Cl. 266-259.000.

Hillman, Darrel D., to Electromatic Drive Corporation. Hysteresis brake assembly. 4,186,320, Cl. 310-93.000.

Hilton, Paul G.; Robusto, Paul F.; and Stephens, Craig P., to Hughes Aircraft Company. Dielectric reflector for selective wavelength reflection. 4,185,894, Cl. 350-338.000.

Himmetsberger, Alois; and Weigl, Erwin, to TMC Corporation. Safety ski binding. 4,185,852, Cl. 280-618.000.

Hindman, Jack W., Jr. Flexible line rotary vegetation cutter having a tension regulated line feed. 4,185,380, Cl. 30-347.000.

Hines, George: *See—*
Engel, Joseph C.; and Hines, George, 4,186,431, Cl. 362-223.000.

Hinze, Jay W., to Owens-Corning Fiberglas Corporation. Manufacturing glass with improved silicon carbide bushing operation. 4,185,980, Cl. 65-1.000.

Hirai, Yutaka; Miyate, Katsuharu; and Aiga, Makoto, to Mitsui Toatsu Chemicals, Incorporated. Process for producing an aromatic urethane. 4,186,269, Cl. 560-25.000.

Hirano, Yutaka: *See—*
Taoka, Tadami; Nakajima, Fumio; Kawamura, Hisashki; Hirano, Yutaka; Maru, Kimio; Arita, Kazutoshi; and Yoshida, Hidemasa, 4,186,305, Cl. 250-311.000.

Hirata, Akio, to Tokyo Shibaura Denki Kabushiki Kaisha. Control systems of alternating current motors. 4,186,334, Cl. 318-805.000.

Hiratsuka, Kenji: *See—*
Sakashita, Kazumi; Hiratsuka, Kenji; Umezu, Yutaka; Nakamura, Nobuo; and Noda, Haruhisa, 4,186,234, Cl. 428-283.000.

Hisa, Yuji: *See—*
Gomi, Teruo; Hisa, Yuji; and Soeda, Takahiko, 4,186,218, Cl. 426-598.000.

Hitachi Chemical Company, Ltd.: *See—*
Okada, Yasunori; Osada, Yuichi; Nakano, Mineo; Kasai, Shozo; Tachiki, Shigeo; Hayashi, Nobuyuki; and Abo, Masahiro, 4,186,122, Cl. 260-31.40R.

Hitachi Ltd.: *See—*
Onoda, Seiichi; Tanaka, Toshiki P.; Suganuma, Tsuneo; Ishida, Koji; and Sumi, Masao, 4,185,890, Cl. 350-96.330.
Yamashita, Hidetaka; and Miura, Yuji, 4,186,382, Cl. 340-166.00R.

Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Aoki, Eiichiro; and Yamaga, Eiichi, to Nippon Gakki Seizo Kabushiki Kaisha. Envelope generator. 4,185,532, Cl. 84-1.260.

Hodogaya Chemical Company, Limited: *See—*
Isogawa, Takayuki; Nagatomi, Makoto; and Imamura, Shosuke, 4,185,994, Cl. 71-118.000.

Hodson, Hollis C. Filler cradle for looseleaf ringbinders. 4,185,934, Cl. 402-80.00L.

Hoechst Aktiengesellschaft: *See—*
Holst, Arno; Kostrzewa, Michael; and Lask, Helmut, 4,186,238, Cl. 428-326.000.
Palmer, Roland, 4,186,017, Cl. 430-162.000.
Rebsdat, Siegfried; Mayer, Sigmund; Alfranseder, Josef; and Riedl, Josef, 4,186,106, Cl. 252-414.000.
Regner, Richard; and Schug, Gerd, 4,185,358, Cl. 17-42.000.

Vogt, Wilhelm; Koch, Jurgen; and Glaser, Hermann, 4,186,112, Cl. 252-471.000.
Hofflinger, Bernd; and Dahms, Jurgen. Charge weighting digital-to-analog converter. 4,186,383, Cl. 340-347.0DA.
Hoffmann-La Roche Inc.: *See*—
Cohen, Noal, 4,186,138, Cl. 260-345.500.
Hohne, Gerd: *See*—
Sohner, Gerhard; Hohne, Gerd; Werner, Peter; Gorille, Ingo; and Roozenbeek, Herman, 4,185,603, Cl. 123-148.00E.
Holladay, John T.: *See*—
Schiff, Robert A.; and Holladay, John T., 4,185,741, Cl. 206-326.000.
Holland, Charles L.; and Nicoloff, George B., to General Dynamics Corporation. Method of manufacturing an inflatable air inlet duct. 4,185,373, Cl. 29-423.000.
Holmes, Jerry D.: *See*—
Schmidt, Robert R., III; and Holmes, Jerry D., 4,186,258, Cl. 525-342.000.
Holmes, John R.; and Jordan, Roy G., to MCA Disco-Vision, Inc. Apparatus for replicating centrally apertured video disc records. 4,185,955, Cl. 425-542.000.
Holmquist, Howard W., to Georgia-Pacific Corporation. Preparation of a lignocellulosic composite. 4,186,242, Cl. 428-528.000.
Holst, Arno; Kostrzewa, Michael; and Lask, Helmut, to Hoechst Aktiengesellschaft. Hydrophilic articles of water-insoluble polymers. 4,186,238, Cl. 428-326.000.
Holste, Merrill R. Turbo-exhaust cleaner. 4,185,459, Cl. 60-280.000.
Holthusen, Bernd, to Dr. Boger Photosatz GmbH. Reproduction cameras and priming exposure devices therefor. 4,185,914, Cl. 355-70.000.
Holtz, Gilbert J. Shopping cart. 4,185,848, Cl. 280-652.000.
Holz, George E., to Burroughs Corporation. Touch panel and operating system. 4,186,392, Cl. 340-712.000.
Homma, Hiroshige: *See*—
Kubo, Kazuo; Ito, Noriki; Souzu, Isao; Isomura, Yasuo; Homma, Hiroshige; and Murakami, Masuo, 4,186,200, Cl. 424-256.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Miyata, Takahide, 4,185,606, Cl. 123-182.000.
Honeywell Inc.: *See*—
Acker, William F., 4,186,384, Cl. 340-347.0AD.
Benton, Ronald, 4,186,315, Cl. 307-117.000.
Bulger, Frederick J., 4,185,712, Cl. 180-131.000.
Hoover, Edsel V.: *See*—
Dilmore, Colonel R.; Hoover, Edsel V.; and Kriss, Allan B., 4,186,065, Cl. 204-98.000.
Hoover Universal, Inc.: *See*—
Hancock, William L., 4,186,223, Cl. 427-185.000.
Horler, Christopher A.: *See*—
Rees, John M.; Horler, Christopher A.; and Downing, Anthony P., 4,185,922, Cl. 316-5.000.
Hornle, Reinhold: *See*—
Aign, Volker; Schulze, Hans; Bremer, Fritz; Hornle, Reinhold; Wolf, Karlheinz; Berlenbach, Wilhelm; and Rasche, Peter, 4,186,029, Cl. 106-308.00Q.
Horton, Edward E., to Deep Oil Technology, Inc. Marine riser system. 4,185,694, Cl. 166-350.000.
Hosokawa, Manabu: *See*—
Nakaso, Tohru; Hosokawa, Manabu; Nomura, Kenzi; and Hikosaka, Tatsuya, 4,185,377, Cl. 29-568.000.
Hosokoshi, Kakuichiro, to Matsushita Electronics Corporation. Shadow mask having vertical pitch about $8/(2n-1)$ times horizontal pitch. 4,186,326, Cl. 313-408.000.
Hostetler, Eldon, to Ziggity Systems, Inc. Watering cup for poultry and animals. 4,185,590, Cl. 119-81.000.
Houbion, John A.; and Schafer, David E., to Monsanto Company. 3-Phenacyl phthaldide safening agents. 4,185,989, Cl. 71-88.000.
Houser, Wesley G., to United States of America, Navy. Device for distinguishing a sine-wave signal from an increase in background noise. 4,185,553, Cl. 102-18.00R.
Howell, F. Maurice. Animal feed containing high molecular weight aliphatic alcohols. 4,186,212, Cl. 424-343.000.
Howell, Stephen L.: *See*—
Robinson, John W.; and Howell, Stephen L., 4,185,530, Cl. 84-1.030.
Howell, William L.: *See*—
Parker, Sidney D.; Carroll, Robert G.; and Howell, William L., 4,185,457, Cl. 60-204.000.
Howerton, Anderson W.; and Burris, Lee R., to Dayco Corporation. Hay conveying belt and hay rake. 4,185,447, Cl. 56-376.000.
Hoyt, William H. Packaging station. 4,185,441, Cl. 53-79.000.
Hruza, Denis E., Sr.: *See*—
Hall, John B.; Hruza, Denis E., Sr.; Shuster, Edward J.; Vock, Manfred H.; and Vinals, Joaquin F., 4,186,103, Cl. 252-174.110.
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,186,150, Cl. 260-586.00G.
Hsu, Hwei P.: *See*—
Kuo, Wey-Chaung; and Hsu, Hwei P., 4,186,286, Cl. 200-19.0DR.
Huang, Patrick C.: *See*—
Esch, Ronald P.; and Huang, Patrick C., 4,186,408, Cl. 357-23.000.
Hubbard, Earl; and Kartanys, Robert J., to Chrysler Corporation. Fuel tank filler tube assembly. 4,185,844, Cl. 280-5.00A.
Huber, Max, to Sulzer Brothers Limited. Packing element of foil-like material for an exchange column. 4,186,159, Cl. 261-112.000.
Hue, Jean-Pierre; Charles, Christian; and Le Foll, Francois, to Centre National Pour l'Exploitation des Oceans (CNEXO). Nodule dredging bucket. 4,185,404, Cl. 37-71.000.
Hueck, Eduard: *See*—
Bischlipp, Klaus; Weitzel, Werner; and Hueck, Walter, 4,185,439, Cl. 52-731.000.
Hueck, Walter: *See*—
Bischlipp, Klaus; Weitzel, Werner; and Hueck, Walter, 4,185,439, Cl. 52-731.000.
Hueschen, Robert E.; and Jens, Richard A., to General Electric Company. Method of making stationary anode x-ray tube with brazed anode assembly. 4,185,365, Cl. 29-25.150.
Hughes Aircraft Company: *See*—
Hilton, Paul G.; Robusto, Paul F.; and Stephens, Craig P., 4,185,894, Cl. 350-338.000.
Stephens, Craig P.; and Toth, Andrew G., 4,185,895, Cl. 350-345.000.
Huliganga, Ernie F.: *See*—
Wang, Samuel S.; Smith, Eugene L., Jr.; and Huliganga, Ernie F., 4,186,083, Cl. 209-166.000.
Humiston, Gerald F. Heat pump method of concentrating fluids. 4,186,311, Cl. 290-1.00R.
Humphrey, James S., Jr.: *See*—
Hall, Walter L.; and Humphrey, James S., Jr., 4,186,221, Cl. 427-45.000.
Hunter, Robert F.; and Spinner, Irving H., to Eco Tec Limited. Process and apparatus for obtaining a more concentrated solution of a component using ion exchange beds. 4,186,174, Cl. 423-54.000.
Hurditch, Rodney J.: *See*—
Heller, Harold G.; Waterworth, Peter; and Hurditch, Rodney J., 4,186,002, Cl. 430-1.000.
Hustler, Inc.: *See*—
Altmayer, John, 4,186,401, Cl. 343-715.000.
Hutcherson, Henry S.: *See*—
Zeigler, George E., Jr.; and Hutcherson, Henry S., 4,186,043, Cl. 156-204.000.
Hutchins, Thomas B. Magnetically driven cardiac-assist pump system. 4,185,617, Cl. 128-1.00D.
Huth, Andreas; Schmiechen, Ralph; Kehr, Wolfgang; Paschelke, Gert; Wachtel, Helmut; Schneider, Herbert H.; and Palenschat, Dieter, to Schering Aktiengesellschaft. 5-(Substituted phenyl)-oxazolidinones and their sulfur analogs. 4,186,129, Cl. 548-186.000.
Hutter, Joseph A.: *See*—
Schwab, Carl E.; and Hutter, Joseph A., 4,186,399, Cl. 343-102.000.
Hutzenlaub, Armin S. P. Arrangement for the drying of solvent at a drying channel. 4,185,397, Cl. 34-77.000.
Hydell, Robert C.: *See*—
Spatz, Sydney M.; Hydell, Robert C.; and Davis, Gerald T., 4,186,115, Cl. 260-22.00R.
Ichiko Industries Limited: *See*—
Ishikawa, Masao; and Nakamura, Tatuo, 4,186,427, Cl. 362-66.000.
Ides, Eugene S. Piston cylinder assembly. 4,185,543, Cl. 92-128.000.
Ifelec, Societe Anonyme: *See*—
Guyot, Pierre; Delfau, Paul; and Amaury, Robert, 4,186,404, Cl. 346-29.000.
Igarashi, Isao: *See*—
Noguchi, Masaaki; Tanaka, Yukiyasu; and Igarashi, Isao, 4,185,596, Cl. 123-51.00B.
Iida, Toshihide: *See*—
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,185,909, Cl. 355-15.000.
Ikeda, Arihiko. Digital time display system. 4,185,452, Cl. 58-23.00R.
Ikeda, Tsutomu: *See*—
Inoue, Katsuhiko; and Ikeda, Tsutomu, 4,185,997, Cl. 75-24.000.
Ilk, Emil. Working method for the automatic bursting-off and grinding the edges of glasses, and automatic machine for carrying out such method. 4,185,419, Cl. 51-5.00R.
Illinois Tool Works Inc.: *See*—
McVey, John K., 4,186,366, Cl. 337-407.000.
Imada, Kunihiko; Ohtake, Katsumasa; Ohshima, Taizo; and Sakaguchi, Sanae, to Sumitomo Chemical Company, Limited. Method for dyeing hydrophobic fiber material with disperse dye. 4,185,959, Cl. 8-26.000.
Imamura, Shosuke: *See*—
Isogawa, Takayuki; Nagatomi, Makoto; and Imamura, Shosuke, 4,185,994, Cl. 71-118.000.
Imperial Chemical Industries Limited: *See*—
Bonsall, Peter C.; Morrison, James W.; Nicholson, Eric S.; Smith, George B.; and Townley, Kenneth G., 4,186,105, Cl. 252-400.00R.
Bramwell, Michael J., 4,186,235, Cl. 428-286.000.
Freeman, John L.; and Rose, John B., 4,186,262, Cl. 528-125.000.
Rees, John M.; Horler, Christopher A.; and Downing, Anthony P., 4,185,922, Cl. 316-5.000.
In Situ Technology, Inc.: *See*—
Terry, Ruel C., 4,185,692, Cl. 166-257.000.
Industrie Pirelli Societa per Azioni: *See*—
Ferrentino, Antonio, 4,185,887, Cl. 350-96.230.
Infra-Vision AG Zug: *See*—
Seitz, Hermann H., 4,185,898, Cl. 352-69.000.
Inman, Billy E., to Spencer Wright Industries, Inc. Method and apparatus for tufting even level cut pile and loop pile in the same row of stitching. 4,185,569, Cl. 112-79.00R.

Innothera: *See—*
Robba, Max F.; and Aurousseau, Michel, 4,186,136, Cl. 544-146.000.
Inoue, Katsuhiko; and Ikeda, Tsutomu, to Kobe Steel Limited. Process for treating basic converter slag. 4,185,997, Cl. 75-24.000.
Institute of Orthopaedics, The: *See—*
Scales, John T., 4,185,341, Cl. 5-461.000.
Interatom, Internationale Atomreaktorbau GmbH: *See—*
Buscher, Enno; and Vinzens, Kurt, 4,186,051, Cl. 176-65.000.
Interlake, Inc.: *See—*
Obermeyer, James H., 4,185,729, Cl. 193-35.00A.
Interlego A.G.: *See—*
Kristiansen, Knud M., 4,185,410, Cl. 46-23.000.
International Business Machines Corporation: *See—*
Abbott, Perry E.; and Noyes, Trigg, 4,185,815, Cl. 271-225.000.
Baechtold, Werner; and Gueret, Pierre, 4,186,441, Cl. 365-160.000.
Bahr, Dietrich J.; and Burckardt, Karl H., 4,186,406, Cl. 346-163.000.
Benson, Paul H.; Kingdom-Hockings, Michael L.; Middleton, Brian H.; Pinnell, Martin C.; Robinson, Thomas E.; Sheeler, Richard E.; and Simmons, John, 4,186,438, Cl. 364-200.000.
Buchmann, Albert H.; Cochran, Thomas J.; Ficker, Walter W.; Stricker, Alfred A.; and von Kaenel, Walter, 4,185,814, Cl. 271-108.000.
Esch, Ronald P.; and Huang, Patrick C., 4,186,408, Cl. 357-23.000.
Lautier, Alex H.; and Monrolin, Jean L., 4,186,348, Cl. 325-320.000.
International Flavors & Fragrances Inc.: *See—*
Hall, John B.; Hruza, Denis E., Sr.; Shuster, Edward J.; Vock, Manfred H.; and Vinals, Joaquin F., 4,186,103, Cl. 252-174.110.
Light, Kenneth K.; Spencer, Bette M.; Vinals, Joaquin F.; Kiwala, Jacob; Vock, Manfred H.; and Shuster, Edward J., 4,186,149, Cl. 260-586.00R.
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,186,150, Cl. 260-586.00G.
International Multifoods Corporation: *See—*
Andersen, Henry K.; and Chipchase, Frank D., 4,185,528, Cl. 83-168.000.
International Standard Electric Corporation: *See—*
Chown, Martin; and Ramsay, Melvin M., 4,185,885, Cl. 350-96.180.
Cragg, William D.; and Lawson, Anthony N., 4,186,323, Cl. 310-324.000.
International Telephone and Telegraph Corporation: *See—*
Corrales, Patrick G., 4,185,886, Cl. 350-96.210.
Interox: *See—*
Brichard, Jean; and Colery, Jean-Claude, 4,185,960, Cl. 8-111.000.
Iowa State University Research Foundation, Inc.: *See—*
Burroughs, Wise; and Trenkle, Allen H., 4,186,213, Cl. 426-2.000.
Irvine, Robert, to Pitney Bowes Inc. Document weighing apparatus. 4,185,709, Cl. 177-145.000.
Isahaya, Fumio, to Koyo Iron Works & Construction Co., Ltd. Electrostatic precipitator. 4,185,971, Cl. 55-113.000.
Ishida, Koji: *See—*
Onoda, Seiichi; Tanaka, Toshiki P.; Suganuma, Tsuneo; Ishida, Koji; and Sumi, Masao, 4,185,890, Cl. 350-96.330.
Ishikawa, Masao; and Nakamura, Tatuo, to Nissan Motor Company, Limited; and Ichiko Industries Limited. Wire length adjusting device of wire for adjusting headlight beam. 4,186,427, Cl. 362-66.000.
Ishiwatari, Masumi, to Canon Kabushiki Kaisha. Booster circuit. 4,186,436, Cl. 363-60.000.
Ishizuka, Ichiro: *See—*
Sugasawa, Tsutomu; Toyoda, Tatsuo; Sasakura, Kazuyuki; Ueda, Shiro; Takase, Akira; Okuno, Katsuto; Ishizuka, Ichiro; and Sumimoto, Shinzaburo, 4,186,144, Cl. 260-465.100.
Isogawa, Takayuki; Nagatomi, Makoto; and Imamura, Shosuke, to Hodogaya Chemical Company, Limited. Herbicidal compound. 4,185,994, Cl. 71-118.000.
Isomura, Yasuo: *See—*
Kubo, Kazuo; Ito, Noriki; Souzu, Isao; Isomura, Yasuo; Homma, Hiroshige; and Murakami, Masuo, 4,186,200, Cl. 424-256.000.
Istituto Biologico Chemioterapico "ABC" S.p.A.: *See—*
Tamietto, Teresio, 4,186,133, Cl. 260-326.13R.
Itakura, Noriyuki: *See—*
Tanoue, Takakiyo; and Itakura, Noriyuki, 4,185,877, Cl. 305-35.00R.
Italsider S.p.A.: *See—*
Parrini, Carlo; and Pozzi, Angelo, 4,186,037, Cl. 148-12.400.
Ito, Katsuo; and Kudoh, Yukio, to Murata Manufacturing Co., Ltd. Contact clip for switch. 4,186,289, Cl. 200-284.000.
Ito, Noriki: *See—*
Kubo, Kazuo; Ito, Noriki; Souzu, Isao; Isomura, Yasuo; Homma, Hiroshige; and Murakami, Masuo, 4,186,200, Cl. 424-256.000.
Itoh, Takayuki: *See—*
Ogawa, Ryota; Okudaira, Sadao; Itoh, Takayuki; and Tachihara, Satoru, 4,185,893, Cl. 350-184.000.
Itoh, Takuji; Sakurada, Satoshi; Okano, Shohei; Obayashi, Takashi; Toyoizumi, Takeo; and Iwata, Osami, to Toa Nenryo Kogyo Kabushiki Kaisha. Catalyst and process for hydrofining petroleum wax. 4,186,078, Cl. 208-27.000.
ITT Industries, Inc.: *See—*
Bernat, Georg, 4,185,659, Cl. 137-625.170.
Chown, Martin; and Leach, John S., 4,185,883, Cl. 350-96.200.
Watson, Christopher A.; Bearcroft, Kenneth E.; Bronzite, Michael; and Palmer, Alan G., 4,185,498, Cl. 73-194.00A.
Iwai, Masakazu: *See—*
Yokoyama, Kazumasa; Iwai, Masakazu; Okamoto, Hiroyuki; and Yamada, Noboru, 4,186,253, Cl. 435-240.000.
Iwao, Kumiry R., to Varian Associates, Inc. Control system for a chromatography apparatus oven door. 4,186,295, Cl. 219-497.000.
Iwasaki, Yoshiki: *See—*
Kasuga, Masao; Takahashi, Nobuaki; Suzuki, Fujio; and Iwasaki, Yoshiki, 4,186,281, Cl. 179-100.4ST.
Iwata, Kazuo: *See—*
Matsuda, Akira; Tojo, Tetsuo; and Iwata, Kazuo, 4,186,240, Cl. 428-349.000.
Iwata, Osami: *See—*
Itoh, Takuji; Sakurada, Satoshi; Okano, Shohei; Obayashi, Takashi; Toyoizumi, Takeo; and Iwata, Osami, 4,186,078, Cl. 208-27.000.
Izzi, Lewis B. Wall urinal mounting flange. 4,185,334, Cl. 4-191.000.
J. I. Case Company: *See—*
Frisbee, Claude M., 4,185,698, Cl. 172-71.000.
J. M. Huber Corporation: *See—*
Grillo, Thomas A., 4,186,224, Cl. 427-221.000.
Jacuzzi Brothers, Inc.: *See—*
Wilkes, Robert D.; Smith, Eugene C.; and Ufford, David E., 4,185,655, Cl. 137-315.000.
Jaeger, Wilbert J. Retractable step for motor vehicle. 4,185,849, Cl. 280-166.000.
Jahnig, Dorothy S. Breast form holder. 4,185,332, Cl. 3-36.000.
Jahnsen, Vilhelm J.; and Campen, Charles F., Jr., to California Institute of Technology. Sample processor for the automatic extraction of families of compounds from liquid samples and/or homogenized solid samples suspended in a liquid. 4,186,187, Cl. 422-64.000.
Jalan, Vinod M.; and Landsman, Douglas A., to United Technologies Corporation. Noble metal-refractory metal alloys as catalysts and method for making. 4,186,110, Cl. 252-447.000.
James, David B. Word puzzle game. 4,185,830, Cl. 273-157.00R.
Jamieson, William B.: *See—*
Harrison, Roger G.; Jamieson, William B.; Ross, William J.; and Saunders, John C., 4,186,204, Cl. 424-269.000.
Jamiolkowski, Dennis D.: *See—*
Shalaby, Shalaby W.; and Jamiolkowski, Dennis D., 4,186,189, Cl. 424-78.000.
Janikowska-Pawlik, Jadwiga: *See—*
Pawlik, Kazimierz; Janikowska-Pawlik, Jadwiga; and Siedlar, Adam, 4,185,708, Cl. 175-410.000.
Janssen, Harald, to Dr. Beck & Co. AG. Insulated wire and method for producing same. 4,186,241, Cl. 428-458.000.
Japan Atomic Energy Research Institute: *See—*
Kinbara, Setsuro, 4,186,298, Cl. 235-92.00T.
Jarby, Sven. Honing and polishing instrument especially intended for dental use. 4,185,388, Cl. 32-59.000.
Jaross, Heinz: *See—*
Clostermeyer, Gerhard; and Jaross, Heinz, 4,185,446, Cl. 56-344.000.
Jastrzebski, Lubomir L.: *See—*
Gatos, Harry C.; and Jastrzebski, Lubomir L., 4,186,045, Cl. 156-602.000.
Jaunin, Jean-Pierre, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Time setting and correcting circuit for electronic timepieces. 4,185,453, Cl. 58-35.00R.
Jens, Richard A.: *See—*
Hueschen, Robert E.; and Jens, Richard A., 4,185,365, Cl. 29-25.150.
Jericho, Karl; Floymayr, Joachim; Reimpell, Uwe; and Drechsel, Dieter, to Leybold-Heraeus GmbH & Co. KG. Apparatus for producing monocrystals. 4,186,173, Cl. 422-250.000.
Jevakohoff, Igor, to Alfa-Laval S.A. Method and apparatus for filling a receptacle with powder. 4,185,669, Cl. 141-59.000.
John E. Mitchell Company: *See—*
Blackburn, James R.; and Smith, Dudley C., 4,185,511, Cl. 74-242.14R.
Johns-Manville Corporation: *See—*
Heitmann, Glenn A., 4,186,236, Cl. 428-291.000.
Kietzman, John H., 4,186,123, Cl. 260-37.0SB.
Necker, Carl G.; and Colwell, Richard R., 4,186,306, Cl. 250-360.000.
Johnson, Carl B., to Pontiac Furniture Industries, Inc. Seat-operated interlock. 4,185,870, Cl. 297-84.000.
Johnson, Donald L., to Teledyne Industries, Inc. Electrical connector for printed circuit boards or the like. 4,185,882, Cl. 339-176.0MP.
Johnson, John. Fireplace heating unit. 4,185,611, Cl. 126-121.000.
Johnson & Johnson: *See—*
Aberson, Gerhard M.; and Stulgate, Emily M., 4,186,165, Cl. 264-112.000.
Jones, Graham; and Unwin, Geoffrey, 4,185,626, Cl. 128-156.000.
McConnell, Wesley J., 4,185,631, Cl. 128-285.000.
Morris, Henrietta K., 4,185,625, Cl. 128-132.00D.
Perfect, Alan J., 4,185,740, Cl. 206-220.000.
Verdicchio, Robert J.; and Rodon, Maria C., 4,186,113, Cl. 252-526.000.
Johnson, Reginald F.; and Cawte, Ronald, to Baker Perkins Holdings Limited. Reel changing device for wrapping machines. 4,185,442, Cl. 53-168.000.
Johnson, Robert D. Skateboard truck with independent wheel suspension. 4,185,847, Cl. 280-87.04A.
Johnson, Steven A. Solar energy absorber apparatus and method. 4,185,616, Cl. 126-443.000.

Johnson, Theodore W.: *See*—
Church, Thomas A.; and Johnson, Theodore W., 4,185,681, Cl. 164-154.000.
Johnston, Walter A. Flashing light safety device for cyclists helmets. 4,186,429, Cl. 362-106.000.
Johnstone, Richard, to Kearney & Trecker Corporation. Unmanned machining center with tool checking. 4,185,376, Cl. 29-568.000.
Jollow, David J. Substituted acetanilides as medicinals. 4,186,209, Cl. 424-324.000.
Jolly, Jean: *See*—
Warnant, Julien; and Jolly, Jean, 4,186,128, Cl. 260-239.500.
Jones, Cynthia G., to Eastman Kodak Company. Covering power photothermographic material and process. 4,186,009, Cl. 430-353.000.
Jones, Glyndwr M., to Winstone Limited. Building block. 4,185,434, Cl. 52-405.000.
Jones, Graham; and Unwin, Geoffrey, to Johnson & Johnson. Material detectably by X-rays. 4,185,626, Cl. 128-156.000.
Jonkers, Cornelius O. Belt conveyor and a belt for use thereon. 4,185,736, Cl. 198-811.000.
Jonnes, Nelson. Method and apparatus for pulling lightweight cable. 4,185,809, Cl. 254-134.400.
Jooss, Helmut: *See*—
Brammer, Hartmut; Jooss, Helmut; Kaiser, Harry; and Schellenberg, Gerhard, 4,185,600, Cl. 123-146.50A.
Jordan, Roy G.: *See*—
Holmes, John R.; and Jordan, Roy G., 4,185,955, Cl. 425-542.000.
Julius Glatz GmbH: *See*—
Riedesser, Walter, 4,185,643, Cl. 131-12.000.
Julius, Robert P., to Nice-Pak Products, Inc. Collapsible recloseable dispenser packet with two part resealable closure. 4,185,754, Cl. 221-63.000.
Juy, Dominique: *See*—
Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,186,194, Cl. 424-89.000.
Juy, Henri, heir: *See*—
Juy, Lucien C. H., deceased, 4,185,510, Cl. 74-217.00B.
Juy, Lucien C. H., deceased (by Juy, Henri, heir), to Etablissements le Simplex. Speed change device with detent means. 4,185,510, Cl. 74-217.00B.
K-D Manufacturing Company: *See*—
Volk, Richard G.; and Muellner, Frank J., 4,186,337, Cl. 324-380.000.
K-Line Industries, Inc.: *See*—
Kammeraad, James A., 4,185,368, Cl. 29-156.70R.
Kabel, Heinrich, to Paul Hellermann GmbH. Two-part hole fastener. 4,185,800, Cl. 248-73.000.
Kabushiki Kaisha Kawaguchiya Hayashi: *See*—
Hayashi, Hisao, 4,185,537, Cl. 89-145.000.
Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Kitagawa, Hiroshi, 4,185,529, Cl. 84-1.010.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Wada, Mitsuyoshi; Hashimoto, Masami; and Nakahara, Teruo, 4,185,662, Cl. 137-636.000.
Kabushiki Kaisha Plastic Kogaku Kenkyusho: *See*—
Murakami, Kenkichi; and Kikuzawa, Yoshiharu, 4,185,954, Cl. 425-462.000.
Kabushiki Kaisha Seikosha: *See*—
Fujita, Masanori; and Oda, Hajime, 4,186,395, Cl. 340-765.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Nagashima, Shinichi, 4,186,385, Cl. 340-365.00S.
Kabushiki Kaisha Toyada Jidoshokki Seisakusho: *See*—
Miyazaki, Tsutomu; and Suzuki, Yoshihisa, 4,185,761, Cl. 226-181.000.
Kaegebein, Daniel P., to TX RX Systems Inc. Notch filter network. 4,186,359, Cl. 333-134.000.
Kaestner, Paul, to Grumman Aerospace Corporation. Laser diode collimation optics. 4,185,891, Cl. 350-167.000.
Kaganovsky, Gary P.: *See*—
Medovar, Boris I.; Artamonov, Viktor L.; Bogachenko, Alexei G.; Shtanko, Jury P.; Bondarenko, Oleg P.; Eltsov, Konstantin S.; Stetsenko, Nikolai V.; Popov, Sergei S.; Kaganovsky, Gary P.; and Korotkov, Albert N., 4,185,683, Cl. 164-252.000.
Kagata, Tooru: *See*—
Yamaguchi, Hiroji; Kato, Kikuo; and Kagata, Tooru, 4,185,727, Cl. 192-89.00B.
Kaiser, Harry: *See*—
Brammer, Hartmut; Jooss, Helmut; Kaiser, Harry; and Schellenberg, Gerhard, 4,185,600, Cl. 123-146.50A.
Kakegawa, Makoto: *See*—
Tanaka, Eiichi; Nohara, Norimasa; Tomitani, Takehiro; Kakegawa, Makoto; and Kumano, Nobuo, 4,186,307, Cl. 250-363.00S.
Kakigi, Takao, to Cybernet Electronic Corp. Synchronous frequency synthesis method for a radio trnsmitter-receiver. 4,186,343, Cl. 325-17.000.
Kakunai, Haruo: *See*—
Nakako, Yukio; Motonaga, Kenjiro; Nada, Junichiro; Ohzawa, Toshio; Yokota, Shizuo; and Kakunai, Haruo, 4,185,395, Cl. 34-12.000.
Kalbfleisch, John M.: *See*—
Sinclair, Edward A.; and Kalbfleisch, John M., 4,186,230, Cl. 428-95.000.
Kallin, Ingmar, to Chore-Time Equipment, Inc. Hog feeder. 4,185,587, Cl. 119-51.110.
Kaltz, Milton C.; and Prechter, Heinz C., to American Sunroof Corporation. Electrically operated hatch roofs. 4,185,868, Cl. 296-137.00B.
Kalvatn, Ivar. Pivotable adjustment mechanism. 4,185,803, Cl. 248-608.000.
Kamath, Venkatesh: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,186,150, Cl. 260-586.00G.
Kamerer, Larry G.: *See*—
Armstrong, Dan H.; and Kamerer, Larry G., 4,185,653, Cl. 137-114.000.
Kamibayashi, Tetsusaburo: *See*—
Kobayashi, Toshihiko; and Kamibayashi, Tetsusaburo, 4,186,272, Cl. 178-19.000.
Kamishima, Akio: *See*—
Nakazato, Motoyasu; Tokumaru, Akira; Kobayashi, Toshitaka; and Kamishima, Akio, 4,185,547, Cl. 99-453.000.
Kammeraad, James A., to K-Line Industries, Inc. Method for making valve guide inserts. 4,185,368, Cl. 29-156.70R.
Kane, Michael P.; and Szmuszkovicz, Jacob, to Upjohn Company, The. Anti-depressant N-(3,4-dichlorophenyl)-N-dimethylaminoalkylene amides. 4,186,208, Cl. 424-324.000.
Kang, Kenneth S.; Veeder, George T., III; and Richey, Danny D., to Merck & Co., Inc. Aqueous polysaccharide composition. 4,186,025, Cl. 106-162.000.
Kanter, Ira E.: *See*—
Smith, Richard C.; and Kanter, Ira E., 4,186,303, Cl. 250-253.000.
Kanto Seiki Company, Limited: *See*—
Uchida, Hisao, 4,186,376, Cl. 340-52.00F.
Karklins, Elgin J.; and Oliver, Michael L., to General Motors Corporation. Springless seal for shock absorber. 4,185,721, Cl. 188-322.000.
Karma Division of Brandt, Inc.: *See*—
Uttech, Raymond E., 4,185,927, Cl. 366-131.000.
Karpisek, Ladislav S., to Zeus Industries Pty. Limited. Cooking apparatus. 4,185,546, Cl. 99-386.000.
Kartanys, Robert J.: *See*—
Hubbard, Earl; and Kartanys, Robert J., 4,185,844, Cl. 280-5.00A.
Kasai, Shozo: *See*—
Okada, Yasunori; Osada, Yuichi; Nakano, Mineo; Kasai, Shozo; Tachiki, Shigeo; Hayashi, Nobuyuki; and Abo, Masahiro, 4,186,122, Cl. 260-31.40R.
Kastrubin, Eduard M.; and Mozhnikov, Valentin M., to Moskovsky Oblastnoi Nauchno-Isslevovatelsky Institut Akusherstva I. Ginekologii. Device for pulse current action on central nervous system. 4,185,640, Cl. 128-421.000.
Kasuga, Masao; Takahashi, Nobuaki; Suzuki, Fujio; and Iwasaki, Yoshiki, to Victor Company of Japan, Ltd. Multichannel record disc reproducing apparatus. 4,186,281, Cl. 179-100.4ST.
Katayose, Shinji: *See*—
Hatori, Yukiyoshi; and Katayose, Shinji, 4,185,562, Cl. 105-152.000.
Kato, Kikuo: *See*—
Yamaguchi, Hiroji; Kato, Kikuo; and Kagata, Tooru, 4,185,727, Cl. 192-89.00B.
Kato, Yoshishige, to Director-General of Agency of Industrial Science and Technology. Method and apparatus for separating substances from liquids by flotation using bubbles. 4,186,087, Cl. 210-44.000.
Katsuki, Kosuke; and Watanabe, Shizuo, to Toray Industries, Inc. Process for producing oxidized or carbon fibers. 4,186,179, Cl. 423-447.400.
Katsumata, Takeshi: *See*—
Shiga, Shujiro; Katsumata, Takeshi; Okamoto, Yasushi; and Higasa, Tadashi, 4,186,177, Cl. 423-239.000.
Katz, Jerome; and Fogel, Sidney J. Method and apparatus for high volume distillation of liquids. 4,186,058, Cl. 203-11.000.
Katz, Jerome; and Fogel, Sidney J. Method and apparatus for high volume distillation of liquids. 4,186,060, Cl. 203-26.000.
Kaufmann, Heinrich: *See*—
Moser, Kurt; and Kaufmann, Heinrich, 4,185,745, Cl. 206-556.000.
Kawamura, Hisashki: *See*—
Taoka, Tadami; Nakajima, Fumio; Kawamura, Hisashki; Hirano, Yutaka; Maru, Kimio; Arita, Kazutoshi; and Yoshida, Hidemasa, 4,186,305, Cl. 250-311.000.
Kearney & Trecker Corporation: *See*—
Johnstone, Richard, 4,185,376, Cl. 29-568.000.
Kehr, Wolfgang: *See*—
Huth, Andreas; Schmiechen, Ralph; Kehr, Wolfgang; Paschelke, Gert; Wachtel, Helmut; Schneider, Herbert H.; and Palenschat, Dieter, 4,186,129, Cl. 548-186.000.
Keithley, Joseph F.; and Sands, Matthew L., to United States of America, Navy. Mine firing system. 4,185,556, Cl. 102-18.00M.
Kelbel, Donald W., to Borg-Warner Corporation. Automatic four-wheel drive transfer case. 4,185,723, Cl. 192-36.000.
Kelsey Hayes Co.: *See*—
Evans, James L., 4,185,370, Cl. 29-159.100.
Kempter, Fritz E.; and Boehlke, Klaus, to BASF Aktiengesellschaft. Anode for cathodic electrocoating. 4,186,075, Cl. 204-294.000.
Kendrick, Edd H., to Rossville Mills, Inc. Positioning and holding mechanisms for filling yarns in a shuttleless loom. 4,185,667, Cl. 139-302.000.
Kenlock Corporation: *See*—
Takahashi, Shoichiro, 4,185,936, Cl. 403-104.000.
Ketterer, Stanley J., to Singer Company, The. Electro-mechanical actuator for use in a sewing machine. 4,185,572, Cl. 112-158.00E.

Kietzman, John H., to Johns-Manville Corporation. Filled polymeric composition. 4,186,123, Cl. 260-37.0SB.

Kigass Engineering Ltd.: *See*—
Twitchett, Stephen R., 4,186,421, Cl. 361-212.000.

Kikuzawa, Yoshiharu: *See*—
Murakami, Kenkichi; and Kikuzawa, Yoshiharu, 4,185,954, Cl. 425-462.000.

Killias, Rudolf, to Lins, Albert. Water mixing valve with temperature regulation, temperature setting and volume control. 4,185,771, Cl. 236-12.00R.

Kimball International, Inc.: *See*—
Robinson, John W.; and Howell, Stephen L., 4,185,530, Cl. 84-1.030.

Kimura, Kozo: *See*—
Umeda, Ikuo; Aiba, Masahiko; and Kimura, Kozo, 4,185,930, Cl. 400-320.000.

Kinbara, Setsuro, to Japan Atomic Energy Research Institute. Method for converting input analog signals to time signals and the time signals to digital values. 4,186,298, Cl. 235-92.00T.

Kingdom-Hockings, Michael L.: *See*—
Benson, Paul H.; Kingdom-Hockings, Michael L.; Middleton, Brian H.; Pinnell, Martin C.; Robinson, Thomas E.; Sheeler, Richard E.; and Simmons, John, 4,186,438, Cl. 364-200.000.

Kinney, Charles W., to Baker International Corporation. Backsurge well cleaning tool. 4,185,690, Cl. 166-183.000.

Kinoshita, Chikao: *See*—
Mizusawa, Motoo; Kinoshita, Chikao; Betsudan, Shinichi; and Sato, Sigeru, 4,186,402, Cl. 343-781.0CA.

Kirkpatrick, III James W.: *See*—
Sullivan, Maurice D., Jr., 4,185,489, Cl. 73-2.000.

Kistler, Jean P.; and Guinot, Michel, to Exxon Research & Engineering Co. Anticaking compositions. 4,185,988, Cl. 71-27.000.

Kitagawa, Hiroshi, to Kabushiki Kaisha Kawai Gakki Seisakusho. Electronic musical instrument. 4,185,529, Cl. 84-1.010.

Kitamura, Taketsugu; and Takagi, Hitoshi, to Asahi Kasei Kogyo Kabushiki Kaisha. Method of simultaneously removing sulfur dioxide and nitrogen oxides from exhaust gases. 4,186,176, Cl. 423-235.000.

Kitchin, Oscar G., to General Motors Corporation. Preassembled unit and roller clutch subassembly having same. 4,185,724, Cl. 192-45.000.

Kiwala, Jacob: *See*—
Light, Kenneth K.; Spencer, Bette M.; Vinals, Joaquin F.; Kiwala, Jacob; Vock, Manfred H.; and Shuster, Edward J., 4,186,149, Cl. 260-586.00R.

Kiyonaga, Kazuo, to Union Carbide Corporation. Process for producing glass in a rotary furnace. 4,185,984, Cl. 65-135.000.

Klein, Howard P.; and Speranza, George P., to Texaco Development Corporation. Bis-quaternary ammonium salts as polyisocyanurate catalysts. 4,186,255, Cl. 521-128.000.

Kleinschmidt, Hans-Joachim; and Faulbecker, Gerd, to Gelenkwellenbau GmbH. Universal joint assembly. 4,185,475, Cl. 64-21.000.

Kleinschmidt, Johann O.; and Schwaab, Konstantin, to Union Special Corporation G.m.b.H. Apparatus for controlling the edge of a tubular workpiece. 4,185,570, Cl. 112-121.260.

Kline, Donald C., to Lehampton Farms, Inc. Rotary extrusion apparatus. 4,185,786, Cl. 241-85.000.

Kloepper, John O.: *See*—
Stoller, Patricia S.; Hammonds, James C.; Kloepper, John O.; and Schlobohm, Arnold, 4,185,564, Cl. 410-64.000.

Knief, Gerald L.: *See*—
Peterson, Jerry D.; and Knief, Gerald L., 4,185,589, Cl. 119-73.000.

Knoblock, Daryl E.; and Carey, Kenneth O., to Hewlett-Packard Company. High-speed data transfer apparatus. 4,186,379, Cl. 340-146.10R.

Kobayashi, Kesanao; Matsumoto, Hiroshi; and Narutomi, Yasuhisa, to Fuji Photo Film Co., Ltd. Method for developing a lithographic printing plate. 4,186,006, Cl. 430-302.000.

Kobayashi, Toshihiko; and Kamibayashi, Tetsusaburo, to Kokusai Denshin Denwa Kabushiki Kaisha. Code generator. 4,186,272, Cl. 178-19.000.

Kobayashi, Toshitaka: *See*—
Nakazato, Motoyasu; Tokumaru, Akira; Kobayashi, Toshitaka; and Kamishima, Akio, 4,185,547, Cl. 99-453.000.

Kobayashi, Yuichi: *See*—
Torii, Sigeru; Kobayashi, Yuichi; and Tanaka, Hideo, 4,186,141, Cl. 260-345.90R.

Kobe Steel Limited: *See*—
Godai, Tomokazu; Takeuchi, Yasuhito; Nakai, Kozo; Takeuchi, Kazuo; and Morioka, Yoshihisa, 4,185,921, Cl. 356-426.000.
Inoue, Katsuhiko; and Ikeda, Tsutomu, 4,185,997, Cl. 75-24.000.
Nakako, Yukio; Motonaga, Kenjiro; Nada, Junichiro; Ohzawa, Toshio; Yokota, Shizuo; and Kakunai, Haruo, 4,185,395, Cl. 34-12.000.

Koch, Franz-Peter: *See*—
Heitmann, Uwe; Steiniger, Wolfgang; Pfannmuller, Joachim; Lorenzen, Heinz-Christen; Koch, Franz-Peter; and Lange, Norbert, 4,185,644, Cl. 131-109.00R.

Koch, Jurgen: *See*—
Vogt, Wilhelm; Koch, Jurgen; and Glaser, Hermann, 4,186,112, Cl. 252-471.000.

Koch, Werner: *See*—
Gerber, Hans; Grueninger, Erwin; Koch, Werner; and Somm, Franz, 4,185,962, Cl. 8-171.000.

Kogan, Rem N.: *See*—
Zabava, Jury G.; Kogan, Rem N.; Lurie, Dzhan A.; Surkov, Viktor G.; Bratslavskaya, Elvira A.; Barabash, Ivan M.; Rodnyanksy, Ilya G.; Maljukyavichjus, Antanas A.; Voitenko, Egor T.; Anisovich, Gennady A.; Bevza, Vladimir F.; Tutov, Vadim I.; Grinberg, Valentin A.; Marukovich, Evgeny I.; and Senkin, Nikolai A., 4,185,684, Cl. 164-263.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Kobayashi, Toshihiko; and Kamibayashi, Tetsusaburo, 4,186,272, Cl. 178-19.000.

Kolar, Frantisek, to Mahle GmbH. Piston for combustion engines. 4,185,544, Cl. 92-220.000.

Komodromos, Costa; Williams, Alan; and Parkyns, Norman, to British Gas Corporation. Process for the production of methane-containing gases and catalyst used in process. 4,185,967, Cl. 48-214.00A.

Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, to Canon Kabushiki Kaisha. Cleaning method and device for electrophotographic machine. 4,185,909, Cl. 355-15.000.

Kondo, Mikio; and Yoshimura, Tadashi, to Matsushita Electric Works, Ltd. Switch. 4,186,362, Cl. 335-205.000.

Konno, Akihiro: *See*—
Murata, Atsuo; Tsuchiya, Shuji; Konno, Akihiro; and Uchida, Jun, 4,186,148, Cl. 260-583.00H.

Kopfer, Rudolph J. Compartmental syringe. 4,185,628, Cl. 128-218.00M.

Koppers Company, Inc.: *See*—
Saracco, Raymond F., 4,185,857, Cl. 285-363.000.

Korotkov, Albert N.: *See*—
Medovar, Boris I.; Artamonov, Viktor L.; Bogachenko, Alexei G.; Shtanko, Jury P.; Bondarenko, Oleg P.; Eltsov, Konstantin S.; Stetsenko, Nikolai V.; Popov, Sergei S.; Kaganovsky, Gary P.; and Korotkov, Albert N., 4,185,683, Cl. 164-252.000.

Kosik, John; and Ritzau, William P., to Consolidated Foods Corporation. Reusable dust bag for vacuum cleaner. 4,185,976, Cl. 55-373.000.

Koso Service Co., Ltd.: *See*—
Domyan, Frank F., 4,185,507, Cl. 74-2.000.

Kostrzewa, Michael: *See*—
Holst, Arno; Kostrzewa, Michael; and Lask, Helmut, 4,186,238, Cl. 428-326.000.

Kotoh, Keigo; and Morinaka, Akiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Radar beacon apparatus. 4,186,396, Cl. 343-6.80R.

Koyama, Mitsuaki: *See*—
Nomura, Yutaka; and Koyama, Mitsuaki, 4,185,910, Cl. 355-15.000.

Koyo Iron Works & Construction Co., Ltd.: *See*—
Isahaya, Fumio, 4,185,971, Cl. 55-113.000.

Kozakai, Masahiro, to Sankyo Kogaku Kogyo Kabushiki Kaisha. Focus detector. 4,186,300, Cl. 250-204.000.

Kraft, Inc.: *See*—
Miller, Roland E.; Scaletta, Joseph A.; and Valek, John, 4,185,488, Cl. 72-350.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Exner, Gerhard; Festinori, Volfango; and Luckschus, Detlef, 4,185,504, Cl. 73-761.000.
Exner, Gerhard; Festinori, Volfango; and Luckschus, Detlef, 4,185,505, Cl. 73-761.000.
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Krajewski, Richard M.; and Erickson, Robert E., to Dow Chemical Company, The. Disposable composite insensitive to surface moisture but disintegratable in aqueous liquid. 4,186,233, Cl. 428-213.000.

Krasnobajew, Victor; and Boeniger, Regula, to Givaudan Corporation. Insolubilized enzyme product. 4,186,053, Cl. 435-180.000.

Kreighbaum, William E.; and Comer, William T., to Mead Johnson & Company. Phenyltetrazolyloxy propanolamines. 4,186,131, Cl. 548-251.000.

Kreitz, Lloyd D. Floating pliers. 4,185,523, Cl. 81-417.000.

Kremer, Manfred, to Still GmbH. Circuit for the energy-conserving braking of a direct-current series-wound motor especially for vehicles. 4,186,333, Cl. 318-376.000.

Krichbaum, Paul L.: *See*—
daCosta, Harry; and Krichbaum, Paul L., 4,186,340, Cl. 324-205.000.

Kriss, Allan B.: *See*—
Dilmore, Colonel R.; Hoover, Edsel V.; and Kriss, Allan B., 4,186,065, Cl. 204-98.000.

Kristiansen, Knud M., to Interlego A.G. Slideable suspension device. 4,185,410, Cl. 46-23.000.

Kronogard, Sven-Olof. Vehicle having at least two driven axles. 4,185,710, Cl. 180-14.00A.

Krude, Werner, to Uni-Cardan Aktiengesellschaft. Constant velocity universal joint. 4,185,476, Cl. 64-21.000.

Krum, Howard L.; and Thienemann, Rolf A., to United States of America, Navy. Printer for electric coding machines. 4,185,928, Cl. 400-90.000.

Krupenin, Nikolai V.: *See*—
Gantts, Vitaly L.; Krupenin, Nikolai V.; Meschanov, Gennady I.; and Peshkov, Izyaslav B., 4,186,041, Cl. 156-53.000.

Ksendzyk, Georgy V.; Frumin, Isidor I.; and Shirin, Vladimir S. Electroslag remelting and surfacing apparatus. 4,185,682, Cl. 164-252.000.

Kubach, Hans: *See*—
Misch, Wolfgang; and Kubach, Hans, 4,185,845, Cl. 280-6.00H.

Kubo, Kazuo; Ito, Noriki; Souzu, Isao; Isomura, Yasuo; Homma, Hiroshige; and Murakami, Masuo, to Yamanouchi Pharmaceutical Co., Ltd. Novel fused derivatives of 2-pyridones. 4,186,200, Cl. 424-256.000.

Kubota, Naohiro; Shibata, Toshihiro; and Sugibuchi, Kazuo, to Argus Chemical Corporation. Process for preparing a 5,5'-methylenebis(2-hydroxy-4-alkoxybenzophenone). 4,186,151, Cl. 260-591.000.

Kuchler, Fritz. Slicing machine with extensible slice table. 4,185,527, Cl. 83-88.000.

Kudoh, Yukio: *See*—
Ito, Katsuo; and Kudoh, Yukio, 4,186,289, Cl. 200-284.000.
Kuipers, Arie: *See*—
van der Lely, Ary; and Kuipers, Arie, 4,185,477, Cl. 64-28.00R.
Kuivalainen, Markku; and Pehkonen, Hannu, to Oy Wartsila Ab. Door closer. 4,185,356, Cl. 16-52.000.
Kulischenko, Walter, to Pennwalt Corporation. Safeguard coupling for power driven flexible shafts. 4,185,474, Cl. 64-4.000.
Kumano, Nobuo: *See*—
Tanaka, Eiichi; Nohara, Norimasa; Tomitani, Takehiro; Kakegawa, Makoto; and Kumano, Nobuo, 4,186,307, Cl. 250-363.00S.
Kunitz, Friedrich-Wilhelm; and Salzmann, Heinz, to Agfa-Gevaert Aktiengesellschaft. Color photographic material containing novel 2-equivalent yellow couplers. 4,186,019, Cl. 430-557.000.
Kuo, Wey-Chaung; and Hsu, Hwei P., to General Motors Corporation. Radio frequency interference suppressing ignition distributor rotor. 4,186,286, Cl. 200-19.0DR.
Kupper, Martin: *See*—
Lohmann, Joachim W.; Ranz, Erwin; and Kupper, Martin, 4,186,011, Cl. 430-505.000.
Kurabayashi, Hiroyuki: *See*—
Minagawa, Nobuhiko; and Kurabayashi, Hiroyuki, 4,186,018, Cl. 430-532.000.
Kurita Water Industries Limited: *See*—
Okada, Hiroo, 4,186,089, Cl. 210-49.000.
Kusters, Eduard: *See*—
Kutz, Johannes, 4,185,344, Cl. 8-149.100.
Kutz, Johannes, to Kusters, Eduard. Installation for dyeing textile material in web form. 4,185,344, Cl. 8-149.100.
Kuyama, Hiroshi: *See*—
Agui, Wataru; Higosaki, Nobuyuki; Yamanari, Koichiro; Furukawa, Toshio; and Kuyama, Hiroshi, 4,186,167, Cl. 264-141.000.
Kvapil, Rudolph; and Clews, K. Malcolm, to Gulf Oil; and Standard Oil. In-situ retorting system. 4,185,871, Cl. 299-2.000.
Kyle, Robert R., to Texas Instruments Incorporated. Marine radio telephone. 4,186,342, Cl. 325-17.000.
Labaz: *See*—
Pigerol, Charles; Chandavoine, Marie-Madeleine; Chignac, Michel; and de Fillain, Paul de Cointet, 4,186,137, Cl. 549-79.000.
Lacchia, Adrien, to Air Industrie. Powder feed device for powder dispensing apparatus. 4,185,783, Cl. 239-704.000.
LaConte, Richard J., to Boeing Company, The. Articulated hinge cooperating with an energy storage device capable of automatically opening and holding open an unlatched compartment door. 4,185,415, Cl. 49-248.000.
Ladder Towers, Inc.: *See*—
Rinehart, Ronald A., 4,185,716, Cl. 182-2.000.
La Dow, William R.: *See*—
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; Benkoe, Elisabeth, executrix; Dantzer, Elonne; La Dow, William R.; Ginn, Wayne M.; and Dyson, L. Ray, 4,185,413, Cl. 46-118.000.
Laermer, Lothar, to Singer Company, The. Modular electronic system with cooling means and stackable electronic circuit unit therefor. 4,186,422, Cl. 361-388.000.
Lagardere, John R.: *See*—
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.
Lagardere, Josette: *See*—
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.
Lagardere, Josette M.: *See*—
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.
Lailach, Gunter: *See*—
Woditsch, Peter; Teichmann, Gunther; Linde, Gunter; Lailach, Gunter; and Rodi, Fritz, 4,186,028, Cl. 106-300.000.
Lamb, Jack W. Display device. 4,185,407, Cl. 40-367.000.
LaMont, Romanus M. Air-flow wig dryer/holder and method of manufacture. 4,185,398, Cl. 34-103.000.
Lancaster, Robert G., to Central Laboratories of Associated Maryland Pathologists, Ltd. Lysing reagent. 4,185,964, Cl. 23-230.00B.
Land, Edwin H., to Polaroid Corporation. Camera having spatially stabilized photocell. 4,185,903, Cl. 354-59.000.
Land, Edwin H.; and Bloom, Stanley M., to Polaroid Corporation. Silver diffusion transfer receiving layer comprising HEC and gelatin. 4,186,013, Cl. 430-228.000.
Land, Edwin H.; and Bloom, Stanley M., to Polaroid Corporation. Silver diffusion transfer receiving layer comprising gelatin and polyvinyl alcohol. 4,186,015, Cl. 430-231.000.
Landreth, George H. Method and apparatus for forming building foundations. 4,186,160, Cl. 264-34.000.
Landsman, Douglas A.: *See*—
Jalan, Vinod M.; and Landsman, Douglas A., 4,186,110, Cl. 252-447.000.
Lange, Norbert: *See*—
Heitmann, Uwe; Steiniger, Wolfgang; Pfannmuller, Joachim; Lorenzen, Heinz-Christen; Koch, Franz-Peter; and Lange, Norbert, 4,185,644, Cl. 131-109.00R.
Langley, Robert C., to Titanium Industries. Electrolysis cathodes with Ag-Ti intermetallic coating. 4,186,066, Cl. 204-98.000.
Laporte, Bernard: *See*—
Boucquey, Jacques; Laporte, Bernard; and Lavallee, Serge, 4,185,428, Cl. 52-233.000.
Lapp, Otto: *See*—
Lohmann, Joachim W.; Lapp, Otto; and Boie, Immo, 4,186,016, Cl. 96-74.000.
Largent, Donald A., Sr. Engine starter and blower interlock system. 4,185,605, Cl. 123-179.00B.
Larrabee, Gary W.: *See*—
McGalliard, Russell L.; and Larrabee, Gary W., 4,185,978, Cl. 62-28.000.
Larson, Dean W.; and Northe, Melvin M. Rigging fitting. 4,185,863, Cl. 294-78.00R.
Lasher, Edward A. Topical anti-fungicide preparation. 4,186,196, Cl. 424-128.000.
Lask, Helmut: *See*—
Holst, Arno; Kostrzewa, Michael; and Lask, Helmut, 4,186,238, Cl. 428-326.000.
Laurent, Roland R., to Cri-Dan. Lathe for the machining of hollow workpieces. 4,185,524, Cl. 82-2.00R.
Laurin, Bernard L.: *See*—
Rotenberg, Don H.; Cuffe, Patricia M.; and Laurin, Bernard L., 4,186,026, Cl. 106-287.140.
Lautier, Alex H.; and Monrolin, Jean L., to International Business Machines Corp. Receiver for data transmitted by means of the interleaved binary phase shift keyed modulation technique. 4,186,348, Cl. 325-320.000.
Lavallee, Serge: *See*—
Boucquey, Jacques; Laporte, Bernard; and Lavallee, Serge, 4,185,428, Cl. 52-233.000.
Lawrence, Richard; and Lovell, Walter. Motorized cart. 4,185,711, Cl. 180-214.000.
Lawson, Anthony N.: *See*—
Cragg, William D.; and Lawson, Anthony N., 4,186,323, Cl. 310-324.000.
Lawson, Gustaf R.: *See*—
Hays, Kenneth S.; and Lawson, Gustaf R., 4,185,519, Cl. 74-577.00S.
Lawson, Victor. Process for producing useful concentrated slurries from waste material. 4,185,680, Cl. 162-5.000.
Leach, John S.: *See*—
Chown, Martin; and Leach, John S., 4,185,883, Cl. 350-96.200.
Lear Siegler, Inc.: *See*—
Pareja, Ramon, 4,185,938, Cl. 403-359.000.
Lebet, Jean-Pierre: *See*—
Boegli, Serge; and Lebet, Jean-Pierre, 4,185,645, Cl. 131-261.00R.
LeBlanc, Lester R.: *See*—
Sternberger, Wayne I.; and LeBlanc, Lester R., 4,186,397, Cl. 343-7.500.
Lederer, Edgar: *See*—
Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,186,194, Cl. 424-89.000.
Leeming, Michael R. G.: *See*—
Penrose, Alexander B.; and Leeming, Michael R. G., 4,186,264, Cl. 424-270.000.
Lefaucheur, Claude A.: *See*—
Greiner, Henri; and Lefaucheur, Claude A., 4,185,675, Cl. 152-354.00R.
Le Foll, Francois: *See*—
Hue, Jean-Pierre; Charles, Christian; and Le Foll, Francois, 4,185,404, Cl. 37-71.000.
Lefrancier, Pierre: *See*—
Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,186,194, Cl. 424-89.000.
Lehampton Farms, Inc.: *See*—
Kline, Donald C., 4,185,786, Cl. 241-85.000.
Leningradsky Politekhn Ichesky Institut Imeni Lensoveta: *See*—
Ordanian, Sergei S.; Lysanov, Vladislav S.; Digonsky, Viktor V.; Blinkov, Vadim A.; Pekelis, Ljubov A.; Denisova, Vera I.; Unrod, Vladimir I.; Sinelnikov, Sergei V.; and Chestnokova, Marina P., 4,186,022, Cl. 106-43.000.
Leto, Maria J., to Poly Pak, Inc. Device for dispensing end wraps. 4,185,753, Cl. 221-45.000.
Leventer, William. Digital character font enhancement device. 4,186,393, Cl. 340-729.000.
Levine, Edward H.; and Newbold, F. E. Dixon. Automatic release bicycle holder. 4,185,850, Cl. 280-296.000.
Levine, Mayer. Fore and aft fuzing system. 4,185,560, Cl. 102-214.000.
Lewis, John A., Jr., to Polaroid Corporation. Dual purpose flash/strobe socket assembly for a photographic camera. 4,185,905, Cl. 354-141.000.
Lewison, Howard L., to Dynamics Corporation of America. Soil contact tool. 4,185,699, Cl. 172-724.000.
Leybold-Heraeus GmbH & Co. KG: *See*—
Jericho, Karl; Floymayr, Joachim; Reimpell, Uwe; and Drechsel, Dieter, 4,186,173, Cl. 422-250.000.
Li, Yao T., to Massachusetts Institute of Technology. Racket and the like. 4,185,822, Cl. 273-73.00C.
Liberty Carton Co.: *See*—
Nymoen, John A., 4,185,565, Cl. 108-51.300.
Licentia Patent-Verwaltung-G.m.b.H.: *See*—
Czech, Johannes; and Dorntlein, Peter, 4,186,358, Cl. 333-33.000.
Licentia Patent-Verwaltungs-G.m.b.H.: *See*—
Wysocki, Bodo, 4,186,346, Cl. 325-144.000.
Lieske, Edgar: *See*—
Tesmann, Holger; Weinrich, Erwin; and Lieske, Edgar, 4,186,186, Cl. 424-62.000.
Liggett Group Inc.: *See*—
Calleson, Donald A., 4,185,393, Cl. 33-178.00R.

Light, Kenneth K.; Spencer, Bette M.; Vinals, Joaquin F.; Kiwala, Jacob; Vock, Manfred H.; and Shuster, Edward J., to International Flavors & Fragrances Inc. Processes for preparing cyclohexadiene derivatives. 4,186,149, Cl. 260-586.00R.

Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., to International Flavors & Fragrances Inc. Novel oxyhydrocarbylnorbornane derivatives and perfumery uses thereof. 4,186,150, Cl. 260-586.00G.

Lilly Industries Limited: *See—*
Harrison, Roger G.; Jamieson, William B.; Ross, William J.; and Saunders, John C., 4,186,204, Cl. 424-269.000.

Lin, Chi-Hung; and Pansing, William F., deceased (by Boyle, Evelyn Pansing, legal representative), to Standard Oil Company (Indiana). Hydrocarbon process for increasing the concentration of normal cis olefins. 4,186,082, Cl. 208-310.00Z.

Lincoln Electric Company, The: *See—*
Gonzalez, John; Young, Ronald F.; and Amata, Mario A., 4,186,293, Cl. 219-146.240.

Linde, Gunter: *See—*
Woditsch, Peter; Teichmann, Gunther; Linde, Gunter; Lailach, Gunter; and Rodi, Fritz, 4,186,028, Cl. 106-300.000.

Linder, Gerald S. Adjustable stop for endotracheal tube guide. 4,185,639, Cl. 128-200.260.

Lindsay, Erin J.: *See—*
Sargent, Frank T.; Antos, John M.; Henke, Arthur W.; Embach, James T.; Butler, Frederick A.; and Lindsay, Erin J., 4,185,337, Cl. 4-300.000.

Lindskog, Eric P. Support roller scrapers for wallboard mastic applying apparatus. 4,185,950, Cl. 425-87.000.

Link, William T.: *See—*
Sherlock, Hugh P.; Ewry, Edwin E.; Sandvoss, Werner E.; Ciupke, Werner W.; Brown, Glenn E.; and Link, William T., 4,185,899, Cl. 352-72.000.

Lins, Albert: *See—*
Killias, Rudolf, 4,185,771, Cl. 236-12.00R.

Lion Fat & Oil Co., Ltd., The: *See—*
Nakamura, Masayoshi; Yazaki, Mitsuyoshi; and Ogoshi, Toshiaki, 4,186,114, Cl. 252-536.000.

Little, Robert T. Exposure delay mechanism. 4,185,906, Cl. 354-152.000.

Little, William R., to United States of America, Navy. Amplifier for missile detonator. 4,185,559, Cl. 102-211.000.

Lo, Wayne, to General Motors Corporation. Semiconductor diode laser with increased frequency tuning range. 4,186,355, Cl. 331-94.50H.

Lohmann, Joachim W.; Ranz, Erwin; and Kupper, Martin, to Agfa-Gevaert Aktiengesellschaft. Color photographic recording material. 4,186,011, Cl. 430-505.000.

Lohmann, Joachim W.; Lapp, Otto; and Boie, Immo, to Agfa-Gevaert Aktiengesellschaft. Color photographic recording material. 4,186,016, Cl. 96-74.000.

Lohmer, Karl: *See—*
Meckl, Heinz; and Lohmer, Karl, 4,186,007, Cl. 430-467.000.

Lohr, David A.: *See—*
Cullis, Herbert M.; DeVries, James H.; Lohr, David A.; Rodriquez, Rodolfo R.; and Uffer, Michael B., 4,185,629, Cl. 128-214.00R.

Long, Ben. Chance device mountable on phonograph turntable. 4,185,829, Cl. 273-142.00K.

Long, Howard W. One hand held and operated clamp. 4,185,811, Cl. 269-6.000.

L'Oreal: *See—*
Goncalves, Antonin L., 4,185,747, Cl. 215-253.000.

Lorenzen, Heinz-Christen: *See—*
Heitmann, Uwe; Steiniger, Wolfgang; Pfannmuller, Joachim; Lorenzen, Heinz-Christen; Koch, Franz-Peter; and Lange, Norbert, 4,185,644, Cl. 131-109.00R.

Lorenzini, Robert A. Reed-holding device. 4,185,535, Cl. 84-383.00R.

Loup, Ronald L.: *See—*
Gill, Arthur W.; Loup, Ronald L.; and Day, Curtis H., 4,185,661, Cl. 137-625.650.

Lovell, Walter: *See—*
Lawrence, Richard; and Lovell, Walter, 4,185,711, Cl. 180-214.000.

Lowrance Electronics, Inc.: *See—*
Maloy, Rex M., 4,186,372, Cl. 367-115.000.

Lubrizol Corporation, The: *See—*
Bryant, Charles P., 4,186,139, Cl. 260-346.740.
Ripple, David E., 4,186,157, Cl. 260-948.000.

Luckenbach, Roy, to Roselon Industries, Inc. Method of making multi-colored yarn. 4,185,364, Cl. 28-218.000.

Luckschus, Detlef: *See—*
Exner, Gerhard; Festinori, Volfango; and Luckschus, Detlef, 4,185,504, Cl. 73-761.000.
Exner, Gerhard; Festinori, Volfango; and Luckschus, Detlef, 4,185,505, Cl. 73-761.000.
Exner, Gerhard; Festinori, Volfango; and Luckschus, Detlef, 4,185,506, Cl. 73-761.000.

Lund-Hansen, Kjeld B.: *See—*
Owner-Petersen, Paul; and Lund-Hansen, Kjeld B., 4,186,297, Cl. 235-89.00R.

Lund-Hansen, Kjeld Balslev: *See—*
Owner-Petersen, Paul; and Lund-Hansen, Kjeld B., 4,186,297, Cl. 235-89.00R.

Lundberg, Knut A. L., to Stal Refrigeration AB. Screw compressor with bearing unloading means. 4,185,949, Cl. 418-203.000.

Lundberg, Robert D.: *See—*
Brenner, Douglas; and Lundberg, Robert D., 4,186,163, Cl. 264-54.000.

Lundblad, John L.; Warner, Willis L.; and Fernandes, Peter M., to Cutter Laboratories, Inc. Stabilized immune serum globulin. 4,186,192, Cl. 424-85.000.

Lundgren, Bengt, to SKF Nova AB. Method for improving the impact strength of a plastics material. 4,186,125, Cl. 260-42.180.

Lupton, Mary: *See—*
Lupton, Stephanie; and Lupton, Mary, 4,185,483, Cl. 70-416.000.

Lupton, Stephanie; and Lupton, Mary. Door locking device. 4,185,483, Cl. 70-416.000.

Lurie, Dzhan A.: *See—*
Zabava, Jury G.; Kogan, Rem N.; Lurie, Dzhan A.; Surkov, Viktor G.; Bratslavskaya, Elvira A.; Barabash, Ivan M.; Rodnyanksy, Ilya G.; Maljukyavichjus, Antanas A.; Voitenko, Egor T.; Anisovich, Gennady A.; Bevza, Vladimir F.; Tutov, Vadim I.; Grinberg, Valentin A.; Marukovich, Evgeny I.; and Senkin, Nikolai A., 4,185,684, Cl. 164-263.000.

Lustig, Leopold P.; and Bishop, Elizabeth A., to Lustig, Leopold P. Dental adjustment devices. 4,185,384, Cl. 433-70.000.

Lyon, Ward L., to Westinghouse Electric Corp. Safe-geometry pneumatic nuclear fuel powder blender. 4,185,926, Cl. 366-101.000.

Lysanov, Vladislav S.: *See—*
Ordanian, Sergei S.; Lysanov, Vladislav S.; Digonsky, Viktor V.; Blinkov, Vadim A.; Pekelis, Ljubov A.; Denisova, Vera I.; Unrod, Vladimir I.; Sinelnikov, Sergei V.; and Chestnokova, Marina P., 4,186,022, Cl. 106-43.000.

Machida, Hideo, to Chuo Meiban Mfg. Co., LTD. Method for attaching component leads to printed circuit base boards and printed circuit base board advantageously used for working said method. 4,185,378, Cl. 29-626.000.

Madec, Paul: *See—*
Pujol, Jean-Claude; Gerard, Jean-Pierre; Madec, Paul; and Metaut, Daniel, 4,185,580, Cl. 114-321.000.

Magara, Kentaro, to Nippon Piston Ring Co., Ltd. Seal ring. 4,185,842, Cl. 277-194.000.

Magill, Jacques R., to Crompton & Knowles Corporation. Heat transfer black dyestuff B. 4,185,957, Cl. 8-2.50R.

Maguire, Stephen B. Peristaltic pump construction. 4,185,948, Cl. 417-477.000.

Mahle GmbH: *See—*
Kolar, Frantisek, 4,185,544, Cl. 92-220.000.

Mahler, Charles J.: *See—*
Taylor, Thomas N.; Mahler, Charles J.; and Stana, James M., 4,185,908, Cl. 355-3.00R.

Maina, Mario J., to General Motors Corporation. Synchronizer arrangements for stepped-ratio transmissions. 4,185,725, Cl. 192-53.00F.

Malec, Robert E., to Ethyl Corporation. Lubricating oil composition. 4,186,102, Cl. 252-51.50R.

Malet, Jean-Claude: *See—*
Duchene, Alain; Malet, Jean-Claude; and Neu, Francis, 4,185,780, Cl. 239-553.500.

Maljukyavichjus, Antanas A.: *See—*
Zabava, Jury G.; Kogan, Rem N.; Lurie, Dzhan A.; Surkov, Viktor G.; Bratslavskaya, Elvira A.; Barabash, Ivan M.; Rodnyanksy, Ilya G.; Maljukyavichjus, Antanas A.; Voitenko, Egor T.; Anisovich, Gennady A.; Bevza, Vladimir F.; Tutov, Vadim I.; Grinberg, Valentin A.; Marukovich, Evgeny I.; and Senkin, Nikolai A., 4,185,684, Cl. 164-263.000.

Maljutin, Gennady G.: *See—*
Shirokov, Vasily I.; Maljutin, Gennady G.; Mishiev, Iliasaf I.; and Saveliev, Jury V., 4,185,977, Cl. 62-23.000.

Maloy, Rex M., to Lowrance Electronics, Inc. Brush holder for rectilinear recorder. 4,186,372, Cl. 367-115.000.

Malyshev, Boris N.: *See—*
Prozorov, Vladimir N.; Malyshev, Boris N.; Ognev, Boris V.; Troitsky, Rostislav A.; and Polonsky, Alexandr K., 4,185,633, Cl. 128-303.100.

Mann, Ralph W.: *See—*
Mounce, Whitman D.; and Mann, Ralph W., 4,185,552, Cl. 102-18.00M.

Marcoux, Jean: *See—*
Forterre, Gerard; and Marcoux, Jean, 4,186,357, Cl. 333-24.100.

Marek, Peter: *See—*
Sachs, Hermann W.; Marek, Peter; and Dorner, Florian, 4,185,755, Cl. 222-43.000.

Marie, Georges R. P.; Allanic, Jacques; and Peltier, Yves J., to Etat Francais Societe Anonyme de Telecommunication. Temperature gradient light waveguide. 4,185,889, Cl. 350-96.320.

Marita, Kouji; and Mogi, Takao, to Sony Corporation. Remote control system. 4,186,345, Cl. 325-37.000.

Markus Hermetische Deuren B. V.: *See—*
Markus, Jan J., 4,185,418, Cl. 49-501.000.

Markus, Jan J., to Markus Hermetische Deuren B. V. Sliding door, meant especially to be used in fire protection or insulation. 4,185,418, Cl. 49-501.000.

Markve, Howard J. Ventilating and insulating garment. 4,185,327, Cl. 2-2.000.

Marsh, Dana G.; and Pochan, John M., to Xerox Corporation. Hybrid fix system incorporating photodegradable polymers. 4,186,003, Cl. 430-97.000.

Marsh, Ronald W., to Pullman Incorporated. Combination seat and step arrangement for railway passenger compartment. 4,185,563, Cl. 105-345.000.

Marshall, John R.: *See—*
Zabsky, John M.; and Marshall, John R., 4,185,664, Cl. 138-40.000.
Marshall, Robert A., to General Electric Company. Current collector with compliant brush containing liquid metal reservoir. 4,186,321, Cl. 310-178.000.
Martin Concrete Engineering Company: *See—*
Hight, Henry D., Jr., 4,186,166, Cl. 264-139.000.
Martin, David A.: *See—*
Rusth, Douglas B.; and Martin, David A., 4,185,545, Cl. 98-33.00A.
Martin, Donald E.: *See—*
Schmidt, John, Jr.; and Martin, Donald E., 4,186,363, Cl. 335-278.000.
Martin, William L.: *See—*
Crumb, Robert E.; Martin, William L.; and Young, Gary C., 4,185,693, Cl. 166-259.000.
Maru, Kimio: *See—*
Taoka, Tadami; Nakajima, Fumio; Kawamura, Hisashki; Hirano, Yutaka; Maru, Kimio; Arita, Kazutoshi; and Yoshida, Hidemasa, 4,186,305, Cl. 250-311.000.
Marukovich, Evgeny I.: *See—*
Zabava, Jury G.; Kogan, Rem N.; Lurie, Dzhan A.; Surkov, Viktor G.; Bratslavskaya, Elvira A.; Barabash, Ivan M.; Rodnyanksy, Ilya G.; Maljukyavichjus, Antanas A.; Voitenko, Egor T.; Anisovich, Gennady A.; Bevza, Vladimir F.; Tutov, Vadim I.; Grinberg, Valentin A.; Marukovich, Evgeny I.; and Senkin, Nikolai A., 4,185,684, Cl. 164-263.000.
Maruyama, Yuji, to West Electric Company, Ltd. Electronic flash. 4,186,328, Cl. 315-151.000.
Marver, Douglas J.: *See—*
Neumeier, Erich; and Marver, Douglas J., 4,185,630, Cl. 128-283.000.
Marx, Paul: *See—*
Bergthaller, Peter; von Bonin, Wulf; Helling, Gunter; and Marx, Paul, 4,186,014, Cl. 430-213.000.
Maschinenfabrik Augsburg-Nuernberg AG: *See—*
Bulang, Wolfgang, 4,185,969, Cl. 55-31.000.
Massachusetts Institute of Technology: *See—*
Gatos, Harry C.; and Jastrzebski, Lubomir L., 4,186,045, Cl. 156-602.000.
Li, Yao T., 4,185,822, Cl. 273-73.00C.
Massiah, Thomas F.: *See—*
Ziegler, Peter; Attwell, Michael C.; Massiah, Thomas F.; and Vergottini, Roberto A., 4,186,143, Cl. 260-397.100.
Master Lock Company: *See—*
Stintzi, Earl G., 4,185,478, Cl. 70-38.00A.
Masterson, Penny Lee: *See—*
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.
Matsubara, Yuji: *See—*
Nagaishi, Hatsuo; Suzuki, Suzuo; and Matsubara, Yuji, 4,185,604, Cl. 123-119.00A.
Matsuda, Akira; Tojo, Tetsuo; and Iwata, Kazuo, to Mitsui Petrochemical Industries Ltd. Thermoplastic olefin resin composition and laminated film or sheet thereof. 4,186,240, Cl. 428-349.000.
Matsumoto, Hiroshi: *See—*
Kobayashi, Kesanao; Matsumoto, Hiroshi; and Narutomi, Yasuhisa, 4,186,006, Cl. 430-302.000.
Matsuo, Katsuyuki, to Alps Electric Co., Ltd. Push button switch. 4,186,290, Cl. 200-159.00A.
Matsushita Electric Industrial Company, Limited: *See—*
Yoshida, Akihiko; and Nishino, Atsushi, 4,186,423, Cl. 361-433.000.
Matsushita Electric Works, Ltd.: *See—*
Kondo, Mikio; and Yoshimura, Tadashi, 4,186,362, Cl. 335-205.000.
Matsushita Electronics Corporation: *See—*
Hosokoshi, Kakuichiro, 4,186,326, Cl. 313-408.000.
Mattano, Leonard A.: *See—*
Yonkers, Robert A.; and Mattano, Leonard A., 4,185,932, Cl. 401-21.000.
Mattei, Frank V., to Ethicon, Inc. Coating composition for sutures. 4,185,637, Cl. 128-335.500.
Maucione, Carl M., to General Electric Company. Method of producing silicon-iron sheet material with boron addition, and product. 4,186,038, Cl. 148-113.000.
Maurer Engineering Inc.: *See—*
Nixon, Jeddy D., Jr., 4,185,704, Cl. 175-76.000.
Maxey, Carl W. Automatic wane detector. 4,186,310, Cl. 250-561.000.
May & Baker Limited: *See—*
Gilmour, James, 4,185,992, Cl. 71-92.000.
Mayer, Sigmund: *See—*
Rebsdat, Siegfried; Mayer, Sigmund; Alfranseder, Josef; and Riedl, Josef, 4,186,106, Cl. 252-414.000.
Mayshar, Andrew G., to Bose Corporation. Sound system control. 4,186,274, Cl. 179-1.00D.
Mazanek, Jan: *See—*
Blahak, Johannes; Gipp, Roland; Wagner, Kuno; Muller, Erwin; Mazanek, Jan; and Haas, Peter, 4,186,257, Cl. 521-159.000.
MCA Disco-Vision, Inc.: *See—*
Holmes, John R.; and Jordan, Roy G., 4,185,955, Cl. 425-542.000.
McAleer, William J.; and Wasmuth, Edward H., to Merck & Co., Inc. Hepatitis B antigen. 4,186,193, Cl. 424-89.000.
McCabe, Francis J., to Prefco Products, Inc. Economy, angle-blade damper kit. 4,185,657, Cl. 137-601.000.
McCabe, Francis J., to Prefco Products, Inc. Rotating blade damper. 4,185,658, Cl. 137-601.000.
McCaskill, John W., to McEvoy Oilfield Equipment Company. Pipe joint with remotely operable latch. 4,185,856, Cl. 285-18.000.
McClure, Kenneth S. Transformation of electrical energy to physical energy. 4,185,593, Cl. 123-1.00A.
McConnell, Wesley J., to Johnson & Johnson. Readily removable expanding catamenial tampon. 4,185,631, Cl. 128-285.000.
McCracken, Lurin K.: *See—*
Henschel, Arthur O., Jr.; and McCracken, Lurin K., 4,186,099, Cl. 210-457.000.
McElroy, David C.: *See—*
Schmidt, William M.; Thorwaldsen, Stanley E.; McElroy, David C.; and Miggels, Stephen G., 4,185,867, Cl. 296-187.000.
McEvoy Oilfield Equipment Company: *See—*
McCaskill, John W., 4,185,856, Cl. 285-18.000.
McGalliard, Russell L.; and Larrabee, Gary W., to Standard Oil Company (Indiana). Method for cryogenic separation of carbon dioxide from hydrocarbons. 4,185,978, Cl. 62-28.000.
McKann, H. Smith, to General Products Company, Inc. Weather seal apparatus. 4,185,417, Cl. 49-470.000.
McKee, William D. Game apparatus including code card, card holder and matrix sheet. 4,185,833, Cl. 273-240.000.
McLaren, Edwin C., to Champion International Corporation. Hermetic sealed carton. 4,185,765, Cl. 229-17.00G.
McLarty, Daniel R., to Textron Inc. Traction-drive transmission. 4,185,509, Cl. 74-200.000.
McLean, William B., to Finch, Walter G. Target seeking gyro. 4,185,797, Cl. 244-3.160.
McMahon, Donald H., to Sperry Corporation. Four port optical internal reflectance switchable coupler. 4,185,884, Cl. 350-96.140.
McMickle, John F., to Cozzoli Machine Co. Arrangements for and methods of improving ampul handling capacity in ampul processing machines. 4,185,732, Cl. 198-455.000.
McMullin, Paul G., to Westinghouse Electric Corp. Light activated silicon switch. 4,186,409, Cl. 357-38.000.
McNew, Thomas A. System for feeding elongated documents to reproducing apparatus. 4,185,760, Cl. 226-109.000.
McVey, John K., to Illinois Tool Works Inc. Radial lead thermal cut-off device. 4,186,366, Cl. 337-407.000.
Mead Corporation, The: *See—*
Spatz, Sydney M.; Hydell, Robert C.; and Davis, Gerald T., 4,186,115, Cl. 260-22.00R.
Mead Johnson & Company: *See—*
Kreighbaum, William E.; and Comer, William T., 4,186,131, Cl. 548-251.000.
Meckl, Heinz; and Lohmer, Karl, to Agfa-Gevaert Aktiengesellschaft. Regeneration of spent color developers. 4,186,007, Cl. 430-467.000.
Medical Aids Research Foundation: *See—*
Alvis, Robert L., 4,185,335, Cl. 4-251.000.
Medland, Morson A. Eavestroughing system. 4,185,420, Cl. 52-11.000.
Medovar, Boris I.; Artamonov, Viktor L.; Bogachenko, Alexei G.; Shtanko, Jury P.; Bondarenko, Oleg P.; Eltsov, Konstantin S.; Stetsenko, Nikolai V.; Popov, Sergei S.; Kaganovsky, Gary P.; and Korotkov, Albert N. Electroslag remelting mould. 4,185,683, Cl. 164-252.000.
Meiji Nyugyo Kabushiki Kaisha: *See—*
Nakazato, Motoyasu; Tokumaru, Akira; Kobayashi, Toshitaka; and Kamishima, Akio, 4,185,547, Cl. 99-453.000.
Meinerding, Wesley C.; and Hensley, Edgar. Vessel mooring device. 4,185,577, Cl. 114-230.000.
Mellors, Geoffrey W., to Union Carbide Corporation. Solid state electrolytes. 4,186,248, Cl. 429-191.000.
Mellors, Geoffrey W., to Union Carbide Corporation. Solid state electrolytes. 4,186,249, Cl. 429-191.000.
Melville, Andreas T.: *See—*
Blumenthal, Robert N.; and Melville, Andreas T., 4,186,072, Cl. 204-195.00S.
Mendola, Salvatore. Apparatus for waterproofing a basement or similar structure. 4,185,429, Cl. 52-274.000.
Menk, F. C. Wave-actuated energy transfer apparatus. 4,185,947, Cl. 417-333.000.
Merck & Co., Inc.: *See—*
Kang, Kenneth S.; Veeder, George T., III; and Richey, Danny D., 4,186,025, Cl. 106-162.000.
McAleer, William J.; and Wasmuth, Edward H., 4,186,193, Cl. 424-89.000.
Merideth, Dallas L., to Engel Industries, Inc. Side access cleat former apparatus and method of use. 4,185,487, Cl. 72-315.000.
Merkel, Jon A. Surveyor's monument. 4,185,425, Cl. 52-103.000.
Merser, Claude: *See—*
Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,186,194, Cl. 424-89.000.
Meschanov, Gennady I.: *See—*
Gantts, Vitaly L.; Krupenin, Nikolai V.; Meschanov, Gennady I.; and Peshkov, Izyaslav B., 4,186,041, Cl. 156-53.000.
Messerly, James W.: *See—*
Powell, Joe A.; Messerly, James W.; and Shippy, Ronald L., 4,186,042, Cl. 156-115.000.
Messick, John J. Sulfonate antioxidants for synthetic and natural rubber. 4,186,126, Cl. 260-45.9AA.
Metal Box Limited: *See—*
Tester, Colin A., 4,185,973, Cl. 55-212.000.
Metaut, Daniel: *See—*
Pujol, Jean-Claude; Gerard, Jean-Pierre; Madec, Paul; and Metaut, Daniel, 4,185,580, Cl. 114-321.000.
Mettoy Company Limited, The: *See—*
Wilford, William P., 4,185,739, Cl. 206-45.140.

Meyer, Bruce R.: *See*—
deBuhr, Alfred P.; Meyer, Bruce R.; and Wilson, Robert J., 4,186,331, Cl. 318-52.000.
Meyer, Jarold A., to Chevron Research Company. Stabilized aluminosilicate hydrocracking catalyst. 4,186,111, Cl. 252-453.000.
Mickelson, Grant A., to Union Oil Company of California. Silica-promoted hydrofining catalyst and process. 4,186,081, Cl. 208-216.00R.
Micro-Plate, Inc.: *See*—
Eidschun, Charles D., 4,186,062, Cl. 204-15.000.
Micro-Sonics, Inc.: *See*—
Moschgat, Robert G., 4,186,387, Cl. 340-384.00E.
Microelectronic Communications Corporation: *See*—
Face, William W., 4,186,279, Cl. 179-90.00B.
Middleton, Brian H.: *See*—
Benson, Paul H.; Kingdom-Hockings, Michael L.; Middleton, Brian H.; Pinnell, Martin C.; Robinson, Thomas E.; Sheeler, Richard E.; and Simmons, John, 4,186,438, Cl. 364-200.000.
Miggels, Stephen G.: *See*—
Schmidt, William M.; Thorwaldsen, Stanley E.; McElroy, David C.; and Miggels, Stephen G., 4,185,867, Cl. 296-187.000.
Mikofalvy, Bela K.: *See*—
Bush, Charles N.; and Mikofalvy, Bela K., 4,186,259, Cl. 526-74.000.
Mikovsky, Richard J.; and Silvestri, Anthony J., to Mobil Oil Corporation. Use of catalyst comprising titania and zirconia in hydrotreating. 4,186,080, Cl. 208-143.000.
Milberger, Lionel J.; and Tucker, Albert R., to FMC Corporation. Method and apparatus for hydraulically controlling subsea well equipment. 4,185,541, Cl. 91-526.000.
Miles Laboratories, Inc.: *See*—
Tarbutton, Peter N., 4,186,251, Cl. 435-11.000.
Miller, Leo C.; Perschy, James A.; and Smith, Gordon D., Jr., to United States of America, Navy. Continuous memory system. 4,186,440, Cl. 364-900.000.
Miller, Roger L.; and Bean, Lloyd F., to Xerox Corporation. Composite developer particles and apparatus for using same. 4,185,916, Cl. 355-3.0DD.
Miller, Roland E.; Scaletta, Joseph A.; and Valek, John, to Kraft, Inc. Method for forming a container pan. 4,185,488, Cl. 72-350.000.
Miller, William M., to General Electric Company. Feed regulator for nutrient film agriculture system. 4,185,414, Cl. 47-62.000.
Milliren, Guy L., to Fluoroware, Inc. Plastic valve. 4,185,807, Cl. 251-218.000.
Mills, David: *See*—
Sellars, Hubert D.; Mills, David; and Ford, Michael F. J., 4,186,222, Cl. 427-134.000.
Minagawa, Nobuhiko; and Kurabayashi, Hiroyuki, to Fuji Photo Film Co., Ltd. Surface treatment of a support member for photographic light-sensitive materials. 4,186,018, Cl. 430-532.000.
Minalga, Philip F., to Singer Company, The. Analog adjustment arrangement in a digitally controlled positioning system. 4,185,571, Cl. 112-158.00B.
Minior, Thaddeus G.; and Tykulsky, Alexander, to Hewlett-Packard Company. Pressure dome. 4,185,641, Cl. 128-675.000.
Minks, Floyd A.: *See*—
Minks, Floyd M.; and Minks, Floyd A., 4,185,602, Cl. 123-148.00E.
Minks, Floyd M.; and Minks, Floyd A. Pulse generator for energy discharge system. 4,185,602, Cl. 123-148.00E.
Minnesota Mining and Manufacturing Company: *See*—
Carlson, Robert C.; and Stoskopf, Albert H., 4,186,108, Cl. 252-426.000.
Edwin, Allan I.; and Bennett, Melvin T., 4,186,380, Cl. 340-147.0SC.
Froehlich, Harold E., 4,185,762, Cl. 227-138.000.
Minnett, Harry C.; and Cooper, Brian F. C., to Commonwealth Scientific and Industrial Research Organization. Modulation of scanning radio beams. 4,186,398, Cl. 343-100.0SA.
Minox GmbH: *See*—
Behr, Karl-Gunter, 4,185,901, Cl. 353-27.00R.
Misch, Wolfgang; and Kubach, Hans, to Robert Bosch GmbH. Level regulator for automotive vehicles. 4,185,845, Cl. 280-6.00H.
Mishiev, Iliasaf I.: *See*—
Shirokov, Vasily I.; Maljutin, Gennady G.; Mishiev, Iliasaf I.; and Saveliev, Jury V., 4,185,977, Cl. 62-23.000.
Mitchell, Leon W.: *See*—
Smith, Jack L.; and Mitchell, Leon W., 4,186,225, Cl. 427-233.000.
Mitchell, Ronald H. Resilient intake and exhaust valve. 4,185,946, Cl. 417-254.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Kotoh, Keigo; and Morinaka, Akiyoshi, 4,186,396, Cl. 343-6.80R.
Mizusawa, Motoo; Kinoshita, Chikao; Betsudan, Shinichi; and Sato, Sigeru, 4,186,402, Cl. 343-781.0CA.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Atsukawa, Masumi; Nishimoto, Yoshihiko; Yokoyama, Naruo; and Sera, Toshikuni, 4,186,109, Cl. 252-440.000.
Tanoue, Takakiyo; and Itakura, Noriyuki, 4,185,877, Cl. 305-35.00R.
Mitsui Petrochemical Industries Ltd.: *See*—
Matsuda, Akira; Tojo, Tetsuo; and Iwata, Kazuo, 4,186,240, Cl. 428-349.000.
Mitsui Toatsu Chemicals, Incorporated: *See*—
Hirai, Yutaka; Miyate, Katsuharu; and Aiga, Makoto, 4,186,269, Cl. 560-25.000.
Miura, Yuji: *See*—
Yamashita, Hidetaka; and Miura, Yuji, 4,186,382, Cl. 340-166.00R.
Miyamoto, Koichi: *See*—
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,185,909, Cl. 355-15.000.
Miyata, Takahide, to Honda Giken Kogyo Kabushiki Kaisha. Decompression operatively connected type kick-starting device. 4,185,606, Cl. 123-182.000.
Miyate, Katsuharu: *See*—
Hirai, Yutaka; Miyate, Katsuharu; and Aiga, Makoto, 4,186,269, Cl. 560-25.000.
Miyazaki, Tsutomu; and Suzuki, Yoshihisa, to Kabushiki Kaisha Toyada Jidoshokki Seisakusho. Pressure roller in spinning machine. 4,185,761, Cl. 226-181.000.
Miyoshi, Shigetoshi: *See*—
Shiomi, Masanao; and Miyoshi, Shigetoshi, 4,185,880, Cl. 308-189.00R.
Mize, Charles J.; and Rumbaugh, James T., to Berkley & Company, Inc. Monofilament weed cutters. 4,186,239, Cl. 428-399.000.
Mizuno, Yutaka: *See*—
Shimura, Noriaki; and Mizuno, Yutaka, 4,186,439, Cl. 364-405.000.
Mizusawa, Motoo; Kinoshita, Chikao; Betsudan, Shinichi; and Sato, Sigeru, to Mitsubishi Denki Kabushiki Kaisha. Cassegrainian antenna with beam waveguide feed to reduce spillover. 4,186,402, Cl. 343-781.0CA.
Mizushima, Eiji: *See*—
Ohsato, Nobuyoshi; Tanaka, Keihachiro; and Mizushima, Eiji, 4,185,981, Cl. 65-5.000.
Mobil Oil Corporation: *See*—
Habib, Edward T., Jr., 4,185,872, Cl. 299-4.000.
Mikovsky, Richard J.; and Silvestri, Anthony J., 4,186,080, Cl. 208-143.000.
Schick, John W.; Davis, Robert H.; and Andress, Harry J., 4,185,485, Cl. 72-42.000.
Mocas, Verlin A., to Richardson Company, The. Vented battery cap. 4,186,247, Cl. 429-88.000.
Modica, Giovanni: *See*—
de Nora, Oronzio; Giuffre, Luigi; and Modica, Giovanni, 4,186,076, Cl. 204-295.000.
Moffett, Everett L.: *See*—
Drimmer, Bernard E.; and Moffett, Everett L., 4,185,551, Cl. 102-15.000.
Mogen David Wine Corporation: *See*—
Sykora, John M.; and Pollack, Theodore W. (said Theodore W. Pollack assors. to), 4,185,767, Cl. 229-39.00R.
Mogi, Takao: *See*—
Marita, Kouji; and Mogi, Takao, 4,186,345, Cl. 325-37.000.
Mohr, Siegfried H.: *See*—
Ammann, Stephan K.; and Mohr, Siegfried H., 4,185,913, Cl. 355-43.000.
Molina, Orlando G., to Rockwell International Corporation. Extender for dye penetrant composition. 4,186,304, Cl. 250-302.000.
Molins, Desmond W.; Warner, Brian H.; Claydon, Alan G.; and Watson, Anthony W., to Molins Limited. Method and apparatus for assembling rod-like articles. 4,185,941, Cl. 406-77.000.
Molins Limited: *See*—
Molins, Desmond W.; Warner, Brian H.; Claydon, Alan G.; and Watson, Anthony W., 4,185,941, Cl. 406-77.000.
Mollering, Hans: *See*—
Roder, Albert; Mollering, Hans; Gruber, Wolfgang; Beaucamp, Klaus; Seidel, Hans; Stahl, Peter; and von Hoerschelmann, Detlef, 4,186,052, Cl. 435-28.000.
Monrolin, Jean L.: *See*—
Lautier, Alex H.; and Monrolin, Jean L., 4,186,348, Cl. 325-320.000.
Monsanto Company: *See*—
D'Amico, John J., 4,185,990, Cl. 71-90.000.
Houbion, John A.; and Schafer, David E., 4,185,989, Cl. 71-88.000.
Montagu, Jean I., to General Scanning Inc. Limited rotation moving iron motor with novel velocity sensing and feedback. 4,186,332, Cl. 318-128.000.
Montedison S.p.A.: *See*—
Cocca, Vincenzo; Tommasi, Ivano; and Cau, Pasqualino, 4,186,232, Cl. 428-177.000.
Di Gioacchino, Alberto; Tommasi, Giulio; and de Manuele, Mario, 4,186,180, Cl. 423-469.000.
Mookherjee, Braja D.: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,186,150, Cl. 260-586.00G.
Moore, M. Samuel; and Paluka, Charles F., to Semco Instruments, Inc. Engine power management system. 4,185,460, Cl. 60-224.000.
Moore, Phillip L.; and Evans, John H., to Stant Manufacturing Company, Inc. Radiator cap. 4,185,751, Cl. 220-203.000.
Moore, Royal C.: *See*—
Roes, John B.; and Moore, Royal C., 4,185,730, Cl. 194-4.00R.
Morales, Juan A. Water closet tank and inclined outlet valve ball element support therefor. 4,185,339, Cl. 4-378.000.
Morello, Edwin F., to Standard Oil Company (Indiana). Injection moldable amide-imide terpolymers containing divalent aromatic quinone radicals. 4,186,263, Cl. 528-128.000.
Morinaga, Marc A.: *See*—
Phillips, Lawrence M.; and Morinaga, Marc A., 4,185,864, Cl. 294-83.00R.
Morinaka, Akiyoshi: *See*—
Kotoh, Keigo; and Morinaka, Akiyoshi, 4,186,396, Cl. 343-6.80R.

Morioka, Yoshihisa: *See*—
Godai, Tomokazu; Takeuchi, Yasuhito; Nakai, Kozo; Takeuchi, Kazuo; and Morioka, Yoshihisa, 4,185,921, Cl. 356-426.000.
Morisawa, Hirokazu: *See*—
Yamazaki, Akihiro; Morisawa, Hirokazu; Oda, Yoshio; and Uchida, Keiichi, 4,186,266, Cl. 544-313.000.
Morris, Henrietta K., to Johnson & Johnson. Surgical cover sheet. 4,185,625, Cl. 128-132.00D.
Morris, William E. Sludge dewatering apparatus. 4,186,098, Cl. 210-386.000.
Morrison, James W.: *See*—
Bonsall, Peter C.; Morrison, James W.; Nicholson, Eric S.; Smith, George B.; and Townley, Kenneth G., 4,186,105, Cl. 252-400.00R.
Morrissey, Ronald J., to Technic, Inc. Method and electrolyte for electrodeposition of bright gold and gold alloys. 4,186,064, Cl. 204-43.00G.
Morrow, Richard B. A., to Triad, Inc. Body parameter display incorporating a battery charger. 4,185,621, Cl. 128-672.000.
Morse, Max A., to Ciba-Geigy AG. Herbicidal compositions and methods. 4,185,993, Cl. 71-93.000.
Morse, Robert A., II; and Rondina, Alfred J., Jr., to General Electric Company. Fluid fitting for turbofan engines. 4,185,462, Cl. 60-261.000.
Mortimer, Thomas J., to Sanders Associates, Inc. Apparatus for receiving encoded messages on the screen of a television receiver and for redisplay thereof on the same receiver screen in a readable format. 4,186,413, Cl. 358-146.000.
Moruzzi, Pietro; and Cadau, Francesco, to Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A. Process for the texturization of polycapronamide fibres and texturized polycapronamide fibres obtained according to the process. 4,185,450, Cl. 57-247.000.
Morville, Malcolm: *See*—
Barnish, Ian T.; Cross, Peter E.; Danilewicz, John C.; and Morville, Malcolm, 4,186,210, Cl. 424-324.000.
Moschgat, Robert G., to Micro-Sonics, Inc. Ultrasonic pest repellent method and system. 4,186,387, Cl. 340-384.00E.
Moser, Kurt; and Kaufmann, Heinrich, to Fa. Develop KG, Dr. Eisbein and Co. Sheet packaging arrangement. 4,185,745, Cl. 206-556.000.
Moser, Paul: *See*—
Rasberger, Michael; Rody, Jean; Moser, Paul; and Muller, Helmut, 4,186,267, Cl. 546-11.000.
Moskovsky Oblastnoi Nauchno-Isslevovatelsky Institut Akusherstva I. Ginekologii: *See*—
Kastrubin, Eduard M.; and Mozhnikov, Valentin M., 4,185,640, Cl. 128-421.000.
Motomura, Kenichi; Yahagi, Mitsuhisa; and Sogi, Toshiyuki, to Bridgestone Tire Company Limited. Reinforced construction of bead portions of radial tires for heavy load vehicles. 4,185,677, Cl. 152-362.00R.
Motonaga, Kenjiro: *See*—
Nakako, Yukio; Motonaga, Kenjiro; Nada, Junichiro; Ohzawa, Toshio; Yokota, Shizuo; and Kakunai, Haruo, 4,185,395, Cl. 34-12.000.
Motorola, Inc.: *See*—
daCosta, Harry; and Krichbaum, Paul L., 4,186,340, Cl. 324-205.000.
Mott, Lambert H. Inertial filter of the porous metal type. 4,186,100, Cl. 210-496.000.
Moulton, Clifford H., to Palmguard Inc. Identification system. 4,186,378, Cl. 340-146.30E.
Mounce, Whitman D.; and Mann, Ralph W., to United States of America, Navy. Mine firing control system. 4,185,552, Cl. 102-18.00M.
Mozhnikov, Valentin M.: *See*—
Kastrubin, Eduard M.; and Mozhnikov, Valentin M., 4,185,640, Cl. 128-421.000.
Mozzi, Catherine M. C.; and Mozzi, Helmut. Word forming game. 4,185,834, Cl. 273-241.000.
Mozzi, Helmut: *See*—
Mozzi, Catherine M. C.; and Mozzi, Helmut, 4,185,834, Cl. 273-241.000.
Muellner, Frank J.: *See*—
Volk, Richard G.; and Muellner, Frank J., 4,186,337, Cl. 324-380.000.
Muhlberg, Erhard, to Siemens Aktiengesellschaft. Method for the operation of internal combustion engines. 4,185,595, Cl. 123-3.000.
Mukaida, Kumio, to Sony Corporation. Gear-driven change-over mechanism. 4,185,794, Cl. 242-201.000.
Muller, Erwin: *See*—
Blahak, Johannes; Gipp, Roland; Wagner, Kuno; Muller, Erwin; Mazanek, Jan; and Haas, Peter, 4,186,257, Cl. 521-159.000.
Muller, Hans-Hermann; and Wulfmeier, Johannes, to Didier Engineering GmbH. Device for closing the filling opening of a coke oven chamber. 4,186,056, Cl. 202-250.000.
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Rasberger, Michael; Rody, Jean; Moser, Paul; and Muller, Helmut, 4,186,267, Cl. 546-11.000.
Mulley, Alan J.: *See*—
Toubkin, Walter M.; and Mulley, Alan J., 4,186,371, Cl. 367-109.000.
Muntz, Eric P., to Grumman Aerospace Corporation. Partial pressure condensation pump. 4,185,466, Cl. 62-55.500.
Murakami, Kenkichi; and Kikuzawa, Yoshiharu, to Kabushiki Kaisha Plastic Kogaku Kenkyusho. Die for extruding tubes composed of a plurality of layers. 4,185,954, Cl. 425-462.000.
Murakami, Masuo: *See*—
Kubo, Kazuo; Ito, Noriki; Souzu, Isao; Isomura, Yasuo; Homma, Hiroshige; and Murakami, Masuo, 4,186,200, Cl. 424-256.000.
Murata, Atsuo; Tsuchiya, Shuji; Konno, Akihiro; and Uchida, Jun, to Nissan Chemical Industries Limited. Process for producing 3,7-dimethyl-2,6-octadienylamine derivatives. 4,186,148, Cl. 260-583.00H.
Murata Manufacturing Co., Ltd.: *See*—
Ito, Katsuo; and Kudoh, Yukio, 4,186,289, Cl. 200-284.000.
Murtaugh, William J.: *See*—
Butte, Walter A., Jr.; and Murtaugh, William J., 4,186,146, Cl. 260-570.50P.
Muzaca, James P.: *See*—
Waclawik, Francis J.; Muzaca, James P.; Cook, Robert A.; Hardin, William A.; Silvia, Alfred D.; and Correia, Ronald, 4,185,345, Cl. 9-8.00R.
Muzyczko, Thaddeus M.; and Thomas, Daniel C., to Richardson Graphics Company. Photopolymerizable latex systems. 4,186,069, Cl. 430-175.000.
Myles, J. Edgar; and Fischer, Edward, to Fischer Sherman, Inc. Anti-vibration pad for pipe support clamp. 4,185,802, Cl. 248-74.00A.
Nabors, James B.: *See*—
Davis, Jay P.; Grace, Henry C.; and Nabors, James B., 4,186,265, Cl. 544-204.000.
Nada, Junichiro: *See*—
Nakako, Yukio; Motonaga, Kenjiro; Nada, Junichiro; Ohzawa, Toshio; Yokota, Shizuo; and Kakunai, Haruo, 4,185,395, Cl. 34-12.000.
Nadimi, Ahmad. Illuminated jewelry. 4,186,425, Cl. 362-32.000.
Naffziger, David H.: *See*—
Dowd, William; and Naffziger, David H., 4,186,270, Cl. 562-496.000.
Nagaishi, Hatsuo; Suzuki, Suzuo; and Matsubara, Yuji, to Nissan Motor Company, Limited. Feedback control system for gas flow in internal combustion engine for purpose of exhaust gas purification. 4,185,604, Cl. 123-119.00A.
Nagase, Tsuneyuki: *See*—
Fujimoto, Masanori; Fukami, Kosuke; Tsuji, Kozo; and Nagase, Tsuneyuki, 4,186,024, Cl. 106-162.000.
Nagashima, Shinichi, to Kabushiki Kaisha Suwa Seikosha. Electronic apparatus push button keyboard assembly. 4,186,385, Cl. 340-365.00S.
Nagatomi, Makoto: *See*—
Isogawa, Takayuki; Nagatomi, Makoto; and Imamura, Shosuke, 4,185,994, Cl. 71-118.000.
Nagatomo, Makoto. Method and apparatus for assemblying spokes to rim of wheel. 4,185,678, Cl. 157-1.550.
Nagel, George W., to Westinghouse Electric Corp. Automatic flue damper control system. 4,185,770, Cl. 236-1.00G.
Nagumo, Shin-ichi: *See*—
Onoda, Michio; Nakajima, Yasuo; Sugihara, Kunihiko; and Nagumo, Shin-ichi, 4,185,599, Cl. 123-75.00B.
Nagy, Arthur E.: *See*—
Proudian, Andrew P.; and Nagy, Arthur E., 4,185,501, Cl. 73-641.000.
Nail, William B. Lock decoding mechanism. 4,185,482, Cl. 70-394.000.
Naito, Hajime, to Crystal Sewing Machine Ind. Co., Ltd. Sewing machine. 4,185,573, Cl. 112-183.000.
Nakada, Akira: *See*—
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Aoki, Eiichiro; and Yamaga, Eiichi, 4,185,532, Cl. 84-1.260.
Nakahara, Teruo: *See*—
Wada, Mitsuyoshi; Hashimoto, Masami; and Nakahara, Teruo, 4,185,662, Cl. 137-636.000.
Nakai, Kozo: *See*—
Godai, Tomokazu; Takeuchi, Yasuhito; Nakai, Kozo; Takeuchi, Kazuo; and Morioka, Yoshihisa, 4,185,921, Cl. 356-426.000.
Nakajima, Fumio: *See*—
Taoka, Tadami; Nakajima, Fumio; Kawamura, Hisashki; Hirano, Yutaka; Maru, Kimio; Arita, Kazutoshi; and Yoshida, Hidemasa, 4,186,305, Cl. 250-311.000.
Nakajima, Yasuo: *See*—
Onoda, Michio; Nakajima, Yasuo; Sugihara, Kunihiko; and Nagumo, Shin-ichi, 4,185,599, Cl. 123-75.00B.
Nakako, Yukio; Motonaga, Kenjiro; Nada, Junichiro; Ohzawa, Toshio; Yokota, Shizuo; and Kakunai, Haruo, to Kobe Steel, Limited. Method for thermal dehydration of brown coal. 4,185,395, Cl. 34-12.000.
Nakamura, Masayoshi; Yazaki, Mitsuyoshi; and Ogoshi, Toshiaki, to Lion Fat & Oil Co., Ltd., The. Free-flowing granular detergent compositions containing olefin sulfonates. 4,186,114, Cl. 252-536.000.
Nakamura, Matsuaki: *See*—
Ogawa, Hiroshi; Nakamura, Matsuaki; and Tamai, Yasuo, 4,186,228, Cl. 428-413.000.
Nakamura, Nobuo: *See*—
Sakashita, Kazumi; Hiratsuka, Kenji; Umezu, Yutaka; Nakamura, Nobuo; and Noda, Haruhisa, 4,186,234, Cl. 428-283.000.
Nakamura, Tatuo: *See*—
Ishikawa, Masao; and Nakamura, Tatuo, 4,186,427, Cl. 362-66.000.
Nakano, Mineo: *See*—
Okada, Yasunori; Osada, Yuichi; Nakano, Mineo; Kasai, Shozo; Tachiki, Shigeo; Hayashi, Nobuyuki; and Abo, Masahiro, 4,186,122, Cl. 260-31.40R.
Nakaso, Tohru; Hosokawa, Manabu; Nomura, Kenzi; and Hikosaka, Tatsuya, to Toyoda Machine Works, Ltd. Machine tool with an automatic tool exchanger. 4,185,377, Cl. 29-568.000.

Nakazato, Motoyasu; Tokumaru, Akira; Kobayashi, Toshitaka; and Kamishima, Akio, to Meiji Nyugyo Kabushiki Kaisha. Apparatus for manufacturing readily soluble granular substances from powdered materials. 4,185,547, Cl. 99-453.000.

Narutomi, Yasuhisa: *See*—
Kobayashi, Kesanao; Matsumoto, Hiroshi; and Narutomi, Yasuhisa, 4,186,006, Cl. 430-302.000.

National Can Corporation: *See*—
George, Robert W., 4,185,576, Cl. 113-1.00D.

National Semiconductor Corporation: *See*—
Page, Ronald W., 4,186,354, Cl. 330-252.000.

Natwick, Vernon R., to Ramtek Corporation. Ball launcher with finger spin loading. 4,185,824, Cl. 273-101.000.

Necker, Carl G.; and Colwell, Richard R., to Johns-Manville Corporation. Perlite expansion density control system. 4,186,306, Cl. 250-360.000.

Nederlandse Naaldenfabriek Muva B.V.: *See*—
Paganoni, Cesare, 4,186,073, Cl. 206-380.000.

Nelson, John E., to Dominion Engineering Works Limited. Grinding mill diaphragm discharge system. 4,185,785, Cl. 241-70.000.

Neu, Francis: *See*—
Duchene, Alain; Malet, Jean-Claude; and Neu, Francis, 4,185,780, Cl. 239-553.500.

Neuhauser, Hans-Joachim: *See*—
Beyer, Horst; Buran, Ulrich; and Neuhauser, Hans-Joachim, 4,185,843, Cl. 277-224.000.

Neumeier, Erich; and Marver, Douglas J., to Diamond Shamrock Corporation. Colostomy apparatus. 4,185,630, Cl. 128-283.000.

Neves, William T.; and Salvador, Anthony R. Method and apparatus for trouble-shooting and irrigation system. 4,185,650, Cl. 137-15.000.

Newbold, F. E. Dixon: *See*—
Levine, Edward H.; and Newbold, F. E. Dixon, 4,185,850, Cl. 280-296.000.

Newton, George: *See*—
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.

Nezworski, James E. Exhaust flue damper and control system therefor. 4,185,769, Cl. 236-1.00G.

Niccols, Paul L., to Harris Hatchery, a part interest. Poultry cleaning method. 4,185,359, Cl. 17-51.000.

Nice-Pak Products, Inc.: *See*—
Julius, Robert P., 4,185,754, Cl. 221-63.000.

Nichols, George M.: *See*—
Albertson, Clarence E.; Nichols, George M.; and Rasmussen, John N., 4,186,063, Cl. 204-29.000.

Nicholson, Eric S.: *See*—
Bonsall, Peter C.; Morrison, James W.; Nicholson, Eric S.; Smith, George B.; and Townley, Kenneth G., 4,186,105, Cl. 252-400.00R.

Nicoloff, George B.: *See*—
Holland, Charles L.; and Nicoloff, George B., 4,185,373, Cl. 29-423.000.

Niehaus, William C.: *See*—
Cho, Alfred Y.; Di Lorenzo, James V.; and Niehaus, William C., 4,186,410, Cl. 357-67.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Aoki, Eiichiro; and Yamaga, Eiichi, 4,185,532, Cl. 84-1.260.

Nippon Piston Ring Co., Ltd.: *See*—
Magara, Kentaro, 4,185,842, Cl. 277-194.000.

Nippon Sheet Glass Co.,Ltd.: *See*—
Ohsato, Nobuyoshi; Tanaka, Keihachiro; and Mizushima, Eiji, 4,185,981, Cl. 65-5.000.

Nippon Zeon Co., Ltd.: *See*—
Yamamoto, Haruhisa; and Akiyama, Shinichi, 4,186,152, Cl. 260-604.00R.

Nishimoto, Yoshihiko: *See*—
Atsukawa, Masumi; Nishimoto, Yoshihiko; Yokoyama, Naruo; and Sera, Toshikuni, 4,186,109, Cl. 252-440.000.

Nishino, Atsushi: *See*—
Yoshida, Akihiko; and Nishino, Atsushi, 4,186,423, Cl. 361-433.000.

Nissan Chemical Industries Limited: *See*—
Murata, Atsuo; Tsuchiya, Shuji; Konno, Akihiro; and Uchida, Jun, 4,186,148, Cl. 260-583.00H.

Nissan Motor Company, Limited: *See*—
Hatori, Yukiyoshi; and Katayose, Shinji, 4,185,562, Cl. 105-152.000.
Ishikawa, Masao; and Nakamura, Tatuo, 4,186,427, Cl. 362-66.000.
Nagaishi, Hatsuo; Suzuki, Suzuo; and Matsubara, Yuji, 4,185,604, Cl. 123-119.00A.
Onoda, Michio; Nakajima, Yasuo; Sugihara, Kunihiko; and Nagumo, Shin-ichi, 4,185,599, Cl. 123-75.00B.
Uchida, Hisao, 4,186,376, Cl. 340-52.00F.

Nitta Belt Kabushiki Kaisha: *See*—
Nitta, Sukekazu; Watanabe, Takuji; and Takahira, Takashi, 4,185,972, Cl. 55-155.000.

Nitta, Sukekazu; Watanabe, Takuji; and Takahira, Takashi, to Nitta Belt Kabushiki Kaisha. Electric charge holding structure for electretized air-filter medium. 4,185,972, Cl. 55-155.000.

Nixon, Jeddy D., Jr., to Maurer Engineering Inc. Directional drilling apparatus. 4,185,704, Cl. 175-76.000.

NL Industries, Inc.: *See*—
Zintz, Howard; Fisher, Richard C.; and Gee, John F., 4,185,652, Cl. 137-81.000.

Noda, Haruhisa: *See*—
Sakashita, Kazumi; Hiratsuka, Kenji; Umezu, Yutaka; Nakamura, Nobuo; and Noda, Haruhisa, 4,186,234, Cl. 428-283.000.

Noguchi, Koichi; and Hibi, Kunio, to Ricoh Company, Ltd. Magnetic developing agent level detection apparatus using an oscillator whose frequency is controlled by the level. 4,186,341, Cl. 324-236.000.

Noguchi, Masaaki; Tanaka, Yukiyasu; and Igarashi, Isao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Two-stroke cycle gasoline engine. 4,185,596, Cl. 123-51.00B.

Nohara, Norimasa: *See*—
Tanaka, Eiichi; Nohara, Norimasa; Tomitani, Takehiro; Kakegawa, Makoto; and Kumano, Nobuo, 4,186,307, Cl. 250-363.00S.

Nomiyama, Tetsuo T. Protective head device. 4,185,331, Cl. 2-411.000.

Nomura, Kenzi: *See*—
Nakaso, Tohru; Hosokawa, Manabu; Nomura, Kenzi; and Hikosaka, Tatsuya, 4,185,377, Cl. 29-568.000.

Nomura, Yutaka; and Koyama, Mitsuaki, to Tokyo Shibaura Electric Co., Ltd. Photoconductive member cleaning device using a magnetic brush for electrostatic copying machines. 4,185,910, Cl. 355-15.000.

Nonnenmacher, Gerhard; Robeller, Walter; Veil, Karl; and Steimann, Roland, to Robert Bosch GmbH. Positive-displacement machine. 4,185,540, Cl. 91-497.000.

Nordin, Elling H.; and Sjoman, Karl O., to Svedia Dental-Industri Aktiebolag. Holder for turbine-driven dental drill. 4,185,386, Cl. 433-82.000.

Nordson Corporation: *See*—
Scharf, Donald R., 4,185,975, Cl. 55-238.000.

Normalair-Garrett (Holdings) Limited: *See*—
Rogers, Brian H.; and Thring, Robin H., 4,185,469, Cl. 62-174.000.

Northe, Melvin M.: *See*—
Larson, Dean W.; and Northe, Melvin M., 4,185,863, Cl. 294-78.00R.

Northern Telecom Limited: *See*—
Ellson, John C., 4,186,282, Cl. 179-175.30R.

Noyes, Trigg: *See*—
Abbott, Perry E.; and Noyes, Trigg, 4,185,815, Cl. 271-225.000.

Nozaki, Tatsuzo; and Ogawa, Yoshihisa. Record reading device for magnetized tags. 4,186,416, Cl. 360-107.000.

Nozawa, Takamitsu, to Yoshino Kogyosho Co., Ltd. Manually operative atomizer. 4,185,776, Cl. 239-333.000.

NTN Toyo Bearing Company, Limited: *See*—
Tsukumo, Zenzaburo, 4,185,738, Cl. 198-814.000.

Numakura, Toshihiko, to Sony Corporation. Recording and playback modulation method and apparatus. 4,186,411, Cl. 358-8.000.

Nunn, Barbara; and Baggaley, Keith H., to Beecham Group Limited. 2-[Gamma-(1-piperidinyl)propyl]-1,2-benzisothiazole-3-one, its salts, and pharmaceutical compositions. 4,186,203, Cl. 424-267.000.

N.V. Klippan S.A.: *See*—
Weman, Per O., 4,185,792, Cl. 242-107.40B.

Nyegaard & Co. A/S: *See*—
Reichelt, Karl-Ludwig; and Trygstad, Olav E., 4,186,198, Cl. 424-177.000.

Nymoen, John A., to Liberty Carton Co. Corrugated pallet. 4,185,565, Cl. 108-51.300.

Obayashi, Takashi: *See*—
Itoh, Takuji; Sakurada, Satoshi; Okano, Shohei; Obayashi, Takashi; Toyoizumi, Takeo; and Iwata, Osami, 4,186,078, Cl. 208-27.000.

Oberheim Electronics, Inc.: *See*—
Oberheim, Thomas E.; and Cooper, James L., 4,185,531, Cl. 84-1.110.

Oberheim, Thomas E.; and Cooper, James L., to Oberheim Electronics, Inc. Music synthesizer programmer. 4,185,531, Cl. 84-1.110.

Oberlander, Richard K., to Conoco, Inc. Alumina dispersion behavior. 4,186,178, Cl. 423-265.000.

Obermeyer, James H., to Interlake, Inc. Conveyor load spacer. 4,185,729, Cl. 193-35.00A.

O'Brien, Edward J., to Spraying Systems Co. Quick-disconnect nozzle connection. 4,185,781, Cl. 239-600.000.

Oda, Hajime: *See*—
Fujita, Masanori; and Oda, Hajime, 4,186,395, Cl. 340-765.000.

Oda, Yoshio: *See*—
Yamazaki, Akihiro; Morisawa, Hirokazu; Oda, Yoshio; and Uchida, Keiichi, 4,186,266, Cl. 544-313.000.

Odenwalder, Heinrich; Puschel, Walter; Pollet, Robert J.; and Ranz, Erwin, to Agfa-Gevaert Aktiengesellschaft. Light sensitive color photographic material containing development inhibitor releasing coupler. 4,186,012, Cl. 430-544.000.

Oganesian, Oganes V.: *See*—
Volkov, Mstislav V.; and Oganesian, Oganes V., 4,185,623, Cl. 128-69.000.

Ogawa, Hiroshi; Nakamura, Matsuaki; and Tamai, Yasuo, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,186,228, Cl. 428-413.000.

Ogawa, Ryota; Okudaira, Sadao; Itoh, Takayuki; and Tachihara, Satoru, to Asahi Kogaku Kogyo Kabushiki Kaisha. Zoom lenses. 4,185,893, Cl. 350-184.000.

Ogawa, Yoshihisa: *See*—
Nozaki, Tatsuzo; and Ogawa, Yoshihisa, 4,186,416, Cl. 360-107.000.

Ogihara, Masaru: *See*—
Akiyama, Kenzo; and Ogihara, Masaru, 4,185,533, Cl. 84-83.000.

Ognev, Boris V.: *See*—
Prozorov, Vladimir N.; Malyshev, Boris N.; Ognev, Boris V.; Troitsky, Rostislav A.; and Polonsky, Alexandr K., 4,185,633, Cl. 128-303.100.

Ogoshi, Toshiaki: *See*—
Nakamura, Masayoshi; Yazaki, Mitsuyoshi; and Ogoshi, Toshiaki, 4,186,114, Cl. 252-536.000.

Ohashi, Tadamasa, to Sanyo Electric Co., Ltd. Digital channel selecting apparatus. 4,186,360, Cl. 334-55.000.

Ohsato, Nobuyoshi; Tanaka, Keihachiro; and Mizushima, Eiji, to Nippon Sheet Glass Co.,Ltd. Method for producing fibers from heat-softening materials. 4,185,981, Cl. 65-5.000.
Ohshima, Taizo: *See*—
Imada, Kunihiko; Ohtake, Katsumasa; Obshima, Taizo; and Sakaguchi, Sanae, 4,185,959, Cl. 8-26.000.
Ohtake, Katsumasa: *See*—
Imada, Kunihiko; Ohtake, Katsumasa; Ohshima, Taizo; and Sakaguchi, Sanae, 4,185,959, Cl. 8-26.000.
Ohzawa, Toshio: *See*—
Nakako, Yukio; Motonaga, Kenjiro; Nada, Junichiro; Ohzawa, Toshio; Yokota, Shizuo; and Kakunai, Haruo, 4,185,395, Cl. 34-12.000.
Okada, Hiroo, to Kurita Water Industries Limited. Method and apparatus for dewatering of sludgy substance. 4,186,089, Cl. 210-49.000.
Okada, Yasunori; Osada, Yuichi; Nakano, Mineo; Kasai, Shozo; Tachiki, Shigeo; Hayashi, Nobuyuki; and Abo, Masahiro, to Hitachi Chemical Company, Ltd. Electrical insulating coatings. 4,186,122, Cl. 260-31.40R.
Okamoto, Hiroyuki: *See*—
Yokoyama, Kazumasa; Iwai, Masakazu; Okamoto, Hiroyuki; and Yamada, Noboru, 4,186,253, Cl. 435-240.000.
Okamoto, Yasushi: *See*—
Shiga, Shujiro; Katsumata, Takeshi; Okamoto, Yasushi; and Higasa, Tadashi, 4,186,177, Cl. 423-239.000.
Okano, Shohei: *See*—
Itoh, Takuji; Sakurada, Satoshi; Okano, Shohei; Obayashi, Takashi; Toyoizumi, Takeo; and Iwata, Osami, 4,186,078, Cl. 208-27.000.
Oki Electric Industry Co., Ltd.: *See*—
Higuchi, Michio; and Hata, Masayasu, 4,186,344, Cl. 325-20.000.
Saito, Makoto, 4,185,503, Cl. 73-653.000.
Takayama, Shoichiro, 4,186,415, Cl. 358-260.000.
Okudaira, Sadao: *See*—
Ogawa, Ryota; Okudaira, Sadao; Itoh, Takayuki; and Tachihara, Satoru, 4,185,893, Cl. 350-184.000.
Okuno, Katsuto: *See*—
Sugasawa, Tsutomu; Toyoda, Tatsuo; Sasakura, Kazuyuki; Ueda, Shiro; Takase, Akira; Okuno, Katsuto; Ishizuka, Ichiro; and Sumimoto, Shinzaburo, 4,186,144, Cl. 260-465.100.
Olin Corporation: *See*—
Preston, Frank J.; and Chandalia, Kiran B., 4,186,271, Cl. 568-607.000.
Oliver, Michael L.: *See*—
Karklins, Elgin J.; and Oliver, Michael L., 4,185,721, Cl. 188-322.000.
Olympian Stone Company: *See*—
Robinson, Ralph C., 4,185,437, Cl. 52-601.000.
Olympus Optical Limited: *See*—
Hanaoka, Naohiro, 4,186,364, Cl. 335-284.000.
Omnitec Products Corporation: *See*—
Young, Ray A.; and Young, Craig A., 4,185,608, Cl. 124-16.000.
Onishi, Shigeru, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine. 4,185,598, Cl. 123-73.00A.
Onoda, Michio; Nakajima, Yasuo; Sugihara, Kunihiko; and Nagumo, Shin-ichi, to Nissan Motor Company, Limited. Control system for varying the amount of scavenging air to be admitted to internal combustion engine. 4,185,599, Cl. 123-75.00B.
Onoda, Seiichi; Tanaka, Toshiki P.; Suganuma, Tsuneo; Ishida, Koji; and Sumi, Masao, to Hitachi Ltd. Optical transmission line. 4,185,890, Cl. 350-96.330.
Op den Camp, Lutz E. A., to Girling Limited. Reservoirs for master cylinders. 4,185,750, Cl. 220-20.500.
Ordanian, Sergei S.; Lysanov, Vladislav S.; Digonsky, Viktor V.; Blinkov, Vadim A.; Pekelis, Ljubov A.; Denisova, Vera I.; Unrod, Vladimir I.; Sinelnikov, Sergei V.; and Chestnokova, Marina P., to Vsesojuzny Nauchno-Issledovatelsky Institut Abrazivov I Shlifovania; and Leningradsky Politekhn Ichesky Institut Imeni Lensoveta. Superhard composite material. 4,186,022, Cl. 106-43.000.
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Weinberg, Alan H.; and O'Sullivan, Dermot M., 4,186,336, Cl. 323-15.000.
Oronzio deNora Impianti Elettrochimici S.p.A.: *See*—
de Nora, Oronzio; Giuffre, Luigi; and Modica, Giovanni, 4,186,076, Cl. 204-295.000.
Ortega, Robert, to Purex Corporation. Circulation and level control valve. 4,185,333, Cl. 4-172.150.
Osada, Yuichi: *See*—
Okada, Yasunori; Osada, Yuichi; Nakano, Mineo; Kasai, Shozo; Tachiki, Shigeo; Hayashi, Nobuyuki; and Abo, Masahiro, 4,186,122, Cl. 260-31.40R.
O'Sullivan, Dermot M.: *See*—
Weinberg, Alan H.; and O'Sullivan, Dermot M., 4,186,336, Cl. 323-15.000.
Otis Elevator Company: *See*—
Van Hise, Albert E., 4,186,420, Cl. 361-194.000.
Otsuka Kagaku Yakuhin Kabushiki Kaisha: *See*—
Torii, Sigeru; Kobayashi, Yuichi; and Tanaka, Hideo, 4,186,141, Cl. 260-345.90R.
Ouellette, Charles W., to Raytheon Company. Transducer housing with release mechanism. 4,186,374, Cl. 367-7.000.
Ouellette, Charles W.: *See*—
Cupolo, John; Salisbury, David J.; and Ouellette, Charles W., 4,186,370, Cl. 367-4.000.
Overton, Arthur W.; and Sykora, Allan J., to Stackpole Components Company. Slide switch. 4,186,288, Cl. 200-164.00R.
Owen, Leslie J., to British Steel Corporation. Gas monitors. 4,185,491, Cl. 73-27.00R.
Owens-Corning Fiberglas Corporation: *See*—
Hinze, Jay W., 4,185,980, Cl. 65-1.000.
Weitzman, Mark R., 4,186,231, Cl. 428-158.000.
Owens-Illinois, Inc.: *See*—
Boling, Norman L.; and Rapp, Charles F., 4,186,033, Cl. 136-89.0FC.
Owner-Petersen, Paul; and Lund-Hansen, Kjeld B., to Lund-Hansen, Kjeld Balslev. Sunlight calculator. 4,186,297, Cl. 235-89.00R.
Oy Wartsila Ab: *See*—
Kuivalainen, Markku; and Pehkonen, Hannu, 4,185,356, Cl. 16-52.000.
PACCAR Inc.: *See*—
Henneman, Richard C.; Burdon, Kenneth A.; and Bruce, Joseph R., 4,185,520, Cl. 74-750.00R.
Pacific Scientific Company: *See*—
Wright, William S., Jr.; and Yang, Elmer C., 4,185,720, Cl. 188-134.000.
Packaging Corporation of America: *See*—
Schiff, Robert A.; and Holladay, John T., 4,185,741, Cl. 206-326.000.
Paganoni, Cesare, to Nederlandse Naaldenfabriek Muva B.V. Package for sewing machine needles or the like. 4,186,073, Cl. 206-380.000.
Page, Ronald W., to National Semiconductor Corporation. Summing amplifier for developing a squelch and meter voltage in a radio receiver. 4,186,354, Cl. 330-252.000.
Pagnotta, Gasper: *See*—
Darrow, Kenneth A.; and Pagnotta, Gasper, 4,185,369, Cl. 29-156.80B.
Palenschat, Dieter: *See*—
Huth, Andreas; Schmiechen, Ralph; Kehr, Wolfgang; Paschelke, Gert; Wachtel, Helmut; Schneider, Herbert H.; and Palenschat, Dieter, 4,186,129, Cl. 548-186.000.
Palmer, Alan G.: *See*—
Watson, Christopher A.; Bearcroft, Kenneth E.; Bronzite, Michael; and Palmer, Alan G., 4,185,498, Cl. 73-194.00A.
Palmer, Ansell W.; and Stevens, Francis J., to General Electric Company. Magnetic clutch and brake assembly. 4,185,722, Cl. 192-18.00B.
Palmer, Geoffrey H., to Beecham Group Limited. Treatment of swine dysentery. 4,186,206, Cl. 424-283.000.
Palmer, Roland, to Hoechst Aktiengesellschaft. Light-sensitive copying composition. 4,186,017, Cl. 430-162.000.
Palmguard Inc.: *See*—
Moulton, Clifford H., 4,186,378, Cl. 340-146.30E.
Palmieri, John P.: *See*—
Palmieri, Vincent A.; and Palmieri, John P., 4,185,381, Cl. 30-347.000.
Palmieri, Vincent A.; and Palmieri, John P. Rotary nylon line vegetation cutter. 4,185,381, Cl. 30-347.000.
Paluka, Charles F.: *See*—
Moore, M. Samuel; and Paluka, Charles F., 4,185,460, Cl. 60-224.000.
Pansing, William F., deceased: *See*—
Lin, Chi-Hung; and Pansing, William F., deceased, 4,186,082, Cl. 208-310.00Z.
Papas, Sophia. Toothbrush contoured to the human mouth. 4,185,349, Cl. 15-106.000.
Pareja, Ramon, to Lear Siegler, Inc. Locking collar for power take-off mounted shafts. 4,185,938, Cl. 403-359.000.
Parker, Sidney D.; Carroll, Robert G.; and Howell, William L., to United Technologies Corporation. Turbofan-ramjet engine. 4,185,457, Cl. 60-204.000.
Parker, William H. C.: *See*—
Eadie, Brian K. M.; Parker, William H. C.; and White, William A., 4,185,449, Cl. 57-125.000.
Parkyns, Norman: *See*—
Komodromos, Costa; Williams, Alan; and Parkyns, Norman, 4,185,967, Cl. 48-214.00A.
Parrini, Carlo; and Pozzi, Angelo, to Italsider S.p.A. Thermal treatment of intermediate quenching and quick tempering through eddy currents and a device for applying said treatment to high productivity rolling plants for flat products. 4,186,037, Cl. 148-12.400.
Parsons, Roy B., to Engraving Specialists (Leicester) Ltd. Method of producing a molded plastic article. 4,186,170, Cl. 264-247.000.
Paschelke, Gert: *See*—
Huth, Andreas; Schmiechen, Ralph; Kehr, Wolfgang; Paschelke, Gert; Wachtel, Helmut; Schneider, Herbert H.; and Palenschat, Dieter, 4,186,129, Cl. 548-186.000.
Pascouet, Adrien P.; and Davies, Chadwick O. Implosive acoustic generator. 4,185,714, Cl. 181-120.000.
Pasko, Walter J.: *See*—
Wiater, Alfons M.; Paternoster, Nicholas L.; and Pasko, Walter J., 4,185,688, Cl. 165-122.000.
Pasternak, Jean: *See*—
Castellani, Jean-Louis; Flayosc, Edmond; and Pasternak, Jean, 4,186,375, Cl. 360-40.000.
Patelis, James. Transport and recovery bed for horses. 4,185,591, Cl. 119-98.000.
Paternoster, Nicholas L.: *See*—
Wiater, Alfons M.; Paternoster, Nicholas L.; and Pasko, Walter J., 4,185,688, Cl. 165-122.000.
Paul Hellermann GmbH: *See*—
Kabel, Heinrich, 4,185,800, Cl. 248-73.000.
Paulson, Eugene K. Inertially triggered fluid flow control device. 4,185,651, Cl. 137-38.000.

Pawlik, Kazimierz; Janikowska-Pawlik, Jadwiga; and Siedlar, Adam, to Akademia Gorniczo-Hunicza im, Stanislawa Staszica. Bit for drilling holes in rocks. 4,185,708, Cl. 175-410.000.

Payne, Ivan C.: *See—*
Blake, Colin C.; and Payne, Ivan C., 4,186,067, Cl. 204-109.000.

Pearsall, Thomas: *See—*
Delagebeaudeuf, Daniel; and Pearsall, Thomas, 4,186,407, Cl. 357-13.000.

Pearson, Arthur: *See—*
Bache, John K.; Sanderson, Albert M.; and Pearson, Arthur, 4,186,039, Cl. 148-128.000.

Peash, Douglas E., to United States of America, Air Force. Secondary seal for tubing joined via V-band couplings. 4,185,858, Cl. 285-367.000.

Pechner, Julius. Key-operated pin tumbler lock. 4,185,480, Cl. 70-358.000.

Peeling, Philip R.: *See—*
Fitch, Steven J.; Peeling, Philip R.; and Heiser, David J., 4,186,088, Cl. 210-45.000.

Pehkonen, Hannu: *See—*
Kuivalainen, Markku; and Pehkonen, Hannu, 4,185,356, Cl. 16-52.000.

Pekelis, Ljubov A.: *See—*
Ordanian, Sergei S.; Lysanov, Vladislav S.; Digonsky, Viktor V.; Blinkov, Vadim A.; Pekelis, Ljubov A.; Denisova, Vera I.; Unrod, Vladimir I.; Sinelnikov, Sergei V.; and Chestnokova, Marina P., 4,186,022, Cl. 106-43.000.

Pelensky, Joseph; and Erdman Charles A., to Graphic Controls Corporation. Marker holder clip. 4,186,405, Cl. 346-140.00A.

Peltier, Yves J.: *See—*
Marie, Georges R. P.; Allanic, Jacques; and Peltier, Yves J., 4,185,889, Cl. 350-96.320.

Pennwalt Corporation: *See—*
Bross, Charles F., 4,185,734, Cl. 198-484.000.
Kulischenko, Walter, 4,185,474, Cl. 64-4.000.
Troost, Robert C., 4,185,473, Cl. 64-2.00R.

Penrose, Alexander B.; and Leeming, Michael R. G., to Pfizer Inc. Triazapentadienes as acaricides. 4,186,264, Cl. 424-270.000.

Pentith, Gerald R. O., to Summit Mining Limited. Plural spaced cutter drums on pivotable elongate arm with loading means in the space. 4,185,876, Cl. 299-45.000.

PepsiCo. Inc.: *See—*
Buchel, Johannes A., 4,186,215, Cl. 426-86.000.

Pereira, Joseph K., to British Steel Corporation. Sealing apparatus for rotary heat exchangers. 4,185,686, Cl. 165-7.000.

Perfect, Alan J., to Johnson & Johnson. Disposable capsules. 4,185,740, Cl. 206-220.000.

Perilstein, Warren L., to Ethyl Corporation. Diesel fuel compositions having anti-wear properties. 4,185,594, Cl. 123-1.00A.

Perkins Research & Manufacturing Co., Inc.: *See—*
Simmonds, James F., 4,186,283, Cl. 179-175.30R.

Perrot, Robert: *See—*
Blanc, Pierre; and Perrot, Robert, 4,185,773, Cl. 238-150.000.

Perry, Ian J., to Copper Refineries Pty. Limited. Cathode for use in the electrolytic refining of copper. 4,186,074, Cl. 204-286.000.

Perschy, James A.: *See—*
Miller, Leo C.; Perschy, James A.; and Smith, Gordon D., Jr., 4,186,440, Cl. 364-900.000.

Peruggi, Richard E.: *See—*
Fleischer, Donald W.; and Peruggi, Richard E., 4,186,381, Cl. 340-152.00R.

Peshkov, Izyaslav B.: *See—*
Gantts, Vitaly L.; Krupenin, Nikolai V.; Meschanov, Gennady I.; and Peshkov, Izyaslav B., 4,186,041, Cl. 156-53.000.

Petera, Frank. Band type lapidary saw. 4,185,609, Cl. 125-21.000.

Peters, Ralph H.: *See—*
West, Gordon B.; and Peters, Ralph H., 4,186,050, Cl. 176-62.000.

Peterson, Bertel R., to FBM International, Inc. Carton for tapered wall containers. 4,185,744, Cl. 206-427.000.

Peterson, Eugenia N. Teeth exerciser. 4,185,817, Cl. 272-95.000.

Peterson, Jerry D.; and Knief, Gerald L., to Ritchie Industries, Inc. Method and apparatus for heating a nipple valve livestock waterer. 4,185,589, Cl. 119-73.000.

Peterson, Wesley R.: *See—*
Brown, Jack; Herr, John; Peterson, Wesley R.; and Wurst, John W., 4,185,575, Cl. 112-277.000.

Petit, Jean-Francois: *See—*
Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,186,194, Cl. 424-89.000.

Petitpierre, Jean C.: *See—*
Garner, Robert; and Petitpierre, Jean C., 4,186,134, Cl. 260-326.13H.

Petrillo, Edward W., Jr., to E. R. Squibb & Sons, Inc. Mercaptoacyl-pyrrolidine phosphonic acids and related compounds. 4,186,268, Cl. 546-21.000.

Petro, John, to Westinghouse Electric Corp. Safety switch which renders high intensity discharge lamp inoperative on accidental breakage of outer envelope. 4,186,327, Cl. 315-73.000.

Pfannmuller, Joachim: *See—*
Heitmann, Uwe; Steiniger, Wolfgang; Pfannmuller, Joachim; Lorenzen, Heinz-Christen; Koch, Franz-Peter; and Lange, Norbert, 4,185,644, Cl. 131-109.00R.

Pfizer Inc.: *See—*
Barnish, Ian T.; Cross, Peter E.; Danilewicz, John C.; and Morville, Malcolm, 4,186,210, Cl. 424-324.000.
Penrose, Alexander B.; and Leeming, Michael R. G., 4,186,264, Cl. 424-270.000.

Phillips, Lawrence M.; and Morinaga, Marc A., to United States of America, Navy. Remotely controlled cyclic grapnel hook apparatus. 4,185,864, Cl. 294-83.00R.

Phillips Petroleum Company: *See—*
Dietz, Richard E., 4,186,260, Cl. 526-106.000.
Hatcher, Charles S.; and Smith, Kenneth E., 4,185,451, Cl. 57-310.000.
Salmon, Emigdio J., 4,186,047, Cl. 159-2.00E.
Tomaja, David L., 4,186,175, Cl. 204-158.00R.
Zellers, Dale A.; and Clark, Joseph W., 4,186,061, Cl. 203-96.000.

Phone-Ducs, Inc.: *See—*
Streit, Kenneth F., 4,185,424, Cl. 52-103.00R.

Piccini, Silvio D. Hydro pneumatic batting practice device and method. 4,185,821, Cl. 273-26.00R.

Pierce, Paul, Jr.; and Beedy, Robert G., to B. H. Bunn Company. Tensioner device for package tying machine. 4,185,548, Cl. 100-27.000.

Pigerol, Charles; Chandavoine, Marie-Madeleine; Chignac, Michel; and de Fillain, Paul de Cointet, to Labaz. Process for preparing 3-thienyl-acetate derivatives. 4,186,137, Cl. 549-79.000.

Pinnell, Martin C.: *See—*
Benson, Paul H.; Kingdom-Hockings, Michael L.; Middleton, Brian H.; Pinnell, Martin C.; Robinson, Thomas E.; Sheeler, Richard E.; and Simmons, John, 4,186,438, Cl. 364-200.000.

Pino, Piero; and von Bezard, Denis, to Pino, Piero. Process for the production of 3-substituted-2,5-dioxo-tetrahydrofuran. 4,186,140, Cl. 260-346.740.

Pirson, Ewald; and Schmidlkofer, Jakob, to Wacker-Chemie GmbH. Antifoam compositions. 4,186,104, Cl. 252-358.000.

Pitney Bowes Inc.: *See—*
Irvine, Robert, 4,185,709, Cl. 177-145.000.

Plan-Sell Oy: *See—*
Heikinheimo, Lennart O., 4,185,733, Cl. 198-477.000.

Plaot, Michael, to Plaot, Michael. Light absorption device for the prevention of stray light in particular in a phototypesetter. 4,185,902, Cl. 354-5.000.

Playsafe Electrics Proprietary Limited: *See—*
Foley, Jeffery R.; and Foley, Daryl J., 4,185,881, Cl. 339-41.000.

Pleion Corporation: *See—*
Gartung, Clifford W., 4,185,430, Cl. 52-285.000.

Plessey Handel und Investments AG: *See—*
Taylor, Brian P.; and Chaudry, Khalid O., 4,185,836, Cl. 274-23.00A.

Plyler, Dennis Michael: *See—*
Plyler, Richard F., 4,185,787, Cl. 241-101.500.

Plyler, Richard F., to Plyler, Dennis Michael, a part interest. Apparatus for making wood shavings. 4,185,787, Cl. 241-101.500.

Plymoth, Jan L. A., to Plymoth PP AB. Suspension arms. 4,185,801, Cl. 248-289.00R.

Plymoth PP AB: *See—*
Plymoth, Jan L. A., 4,185,801, Cl. 248-289.00R.

Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes: *See—*
Greiner, Henri; and Lefaucheur, Claude A., 4,185,675, Cl. 152-354.00R.

Pochan, John M.: *See—*
Marsh, Dana G.; and Pochan, John M., 4,186,003, Cl. 430-97.000.

Polaroid Corporation: *See—*
Erikson, Herman E., 4,186,308, Cl. 250-480.000.
Foley, James W., 4,186,001, Cl. 430-220.000.
Haberlin, Richard J.; and Stephens, Robert K., 4,186,005, Cl. 430-228.000.
Land, Edwin H., 4,185,903, Cl. 354-59.000.
Land, Edwin H.; and Bloom, Stanley M., 4,186,013, Cl. 430-228.000.
Land, Edwin H.; and Bloom, Stanley M., 4,186,015, Cl. 430-231.000.
Lewis, John A., Jr., 4,185,905, Cl. 354-141.000.

Pollack, Theodore W.: *See—*
Sykora, John M.; and Pollack, Theodore W., 4,185,767, Cl. 229-39.00R.

Pollet, Robert J.: *See—*
Odenwalder, Heinrich; Puschel, Walter; Pollet, Robert J.; and Ranz, Erwin, 4,186,012, Cl. 430-544.000.

Polonsky, Alexandr K.: *See—*
Prozorov, Vladimir N.; Malyshev, Boris N.; Ognev, Boris V.; Troitsky, Rostislav A.; and Polonsky, Alexandr K., 4,185,633, Cl. 128-303.100.

Poly Pak, Inc.: *See—*
Leto, Maria J., 4,185,753, Cl. 221-45.000.

Pontiac Furniture Industries, Inc.: *See—*
Johnson, Carl B., 4,185,870, Cl. 297-84.000.

Popov, Sergei S.: *See—*
Medovar, Boris I.; Artamonov, Viktor L.; Bogachenko, Alexei G.; Shtanko, Jury P.; Bondarenko, Oleg P.; Eltsov, Konstantin S.; Stetsenko, Nikolai V.; Popov, Sergei S.; Kaganovsky, Gary P.; and Korotkov, Albert N., 4,185,683, Cl. 164-252.000.

Population Research, Inc.: *See—*
Corey, Harold, 4,185,618, Cl. 128-1.00R.

Potts, Irwin W., to Dow Chemical Company, The. Process for 1,2,4,5-tetrachlorobenzene. 4,186,153, Cl. 260-650.00R.

Powell, Joe A.; Messerly, James W.; and Shippy, Ronald L., to B. F. Goodrich Company, The. Puncture sealing tire. 4,186,042, Cl. 156-115.000.
Pozzi, Angelo: *See—*
Parrini, Carlo; and Pozzi, Angelo, 4,186,037, Cl. 148-12.400.
PPG Industries, Inc.: *See—*
Dilmore, Colonel R.; Hoover, Edsel V.; and Kriss, Allan B., 4,186,065, Cl. 204-98.000.
Febbo, Anthony R., 4,185,983, Cl. 65-104.000.
Frank, Robert G., 4,185,986, Cl. 65-287.000.
Schimmel, Karl F.; Sturni, Lance C.; and Robles, Martin J., 4,186,124, Cl. 260-37.0EP.
Schwenninger, Ronald L., 4,185,982, Cl. 65-29.000.
Prechter, Heinz C.: *See—*
Kaltz, Milton C.; and Prechter, Heinz C., 4,185,868, Cl. 296-137.00B.
Prefco Products, Inc.: *See—*
McCabe, Francis J., 4,185,657, Cl. 137-601.000.
McCabe, Francis J., 4,185,658, Cl. 137-601.000.
Prescott, William A., to A-T-O Inc. Extension/elevation intra-action device for aerial lift apparatus. 4,185,426, Cl. 52-115.000.
Presta, John C.: *See—*
Yates, Derek N.; and Presta, John C., 4,185,472, Cl. 64-1.00S.
Preston, Frank J.; and Chandalia, Kiran B., to Olin Corporation. Unsaturated polyols containing alkenyl aryl constituents. 4,186,271, Cl. 568-607.000.
Prete, Ernest, Jr.; and Clay, Herbert N., to Ancra Corporation. Ratchet buckle for tightening and tensioning strap. 4,185,360, Cl. 24-68.0CD.
Priestley, Harry: *See—*
Bardsley, Harold B.; and Priestley, Harry, 4,185,568, Cl. 112-79.00R.
Printal Oy: *See—*
Vartia, Matti, 4,185,749, Cl. 220-72.000.
Produits Chimiques Ugine Kuhlmann: *See—*
Delsarte, Jacques, 4,186,155, Cl. 525-78.000.
Propp, Horst-Joachim, to Vereinigte Flugtechnische Werke-Fokker GmbH. Multi-component protective covering for construction parts designed to protect against the effects of lightning. 4,186,237, Cl. 428-323.000.
Proudian, Andrew P.; and Nagy, Arthur E., to Second Foundation. Ultrasonic sector scanner. 4,185,501, Cl. 73-641.000.
Prozorov, Vladimir N.; Malyshev, Boris N.; Ognev, Boris V.; Troitsky, Rostislav A.; and Polonsky, Alexandr K. Method of surgical treatment using laser emission and apparatus for realizing same. 4,185,633, Cl. 128-303.100.
Puchy, David P. W. Inter-engaging upholstery button anchors. 4,185,367, Cl. 29-91.100.
Pujol, Jean-Claude; Gerard, Jean-Pierre; Madec, Paul; and Metaut, Daniel, to Etat Francais, Delegation Ministerielle pour l'Armement. Submarine system. 4,185,580, Cl. 114-321.000.
Pullman Incorporated: *See—*
Marsh, Ronald W., 4,185,563, Cl. 105-345.000.
Purex Corporation: *See—*
Ortega, Robert, 4,185,333, Cl. 4-172.150.
Puschel, Walter: *See—*
Odenwalder, Heinrich; Puschel, Walter; Pollet, Robert J.; and Ranz, Erwin, 4,186,012, Cl. 430-544.000.
Quantor Corporation: *See—*
Ammann, Stephan K.; and Mohr, Siegfried H., 4,185,913, Cl. 355-43.000.
Quelle, Fred W., Jr. Cryptographic system employing optical scrambling arrays. 4,185,888, Cl. 350-96.250.
Quinville, James A., to United States of America, Air Force. Re-entry vehicle boundary layer transition suppressor. 4,185,558, Cl. 102-105.000.
Rabindran, K. George; and Stites, David G., to Bell & Howell Company. Roll film reader/printer with manually insertable discrete film. 4,185,900, Cl. 353-26.00R.
Radek, John R., to Ready Metal Manufacturing Company. Free standing wall. 4,185,422, Cl. 52-36.000.
Radsavitch, Joseph L. Chimney cleaning apparatus. 4,185,351, Cl. 15-243.000.
Rahmstorf, Dietmar, to BIG Spielwarenfabrik Dipl.-Ing. Ernst A. Bettag. Toy figure with accessories. 4,185,412, Cl. 46-116.000.
Rainey, Don E. Ocean tide energy converter having improved efficiency. 4,185,464, Cl. 60-496.000.
Raluy, Antoine, to Compagnie Generale des Etablissements Michelin. Pneumatic tire. 4,185,676, Cl. 152-362.00R.
Ramsay, Melvin M.: *See—*
Chown, Martin; and Ramsay, Melvin M., 4,185,885, Cl. 350-96.180.
Ramtek Corporation: *See—*
Natwick, Vernon R., 4,185,824, Cl. 273-101.000.
Ranz, Erwin: *See—*
Lohmann, Joachim W.; Ranz, Erwin; and Kupper, Martin, 4,186,011, Cl. 430-505.000.
Odenwalder, Heinrich; Puschel, Walter; Pollet, Robert J.; and Ranz, Erwin, 4,186,012, Cl. 430-544.000.
Rapp, Charles F.: *See—*
Boling, Norman L.; and Rapp, Charles F., 4,186,033, Cl. 136-89.0FC.
Rasberger, Michael; Rody, Jean; Moser, Paul; and Muller, Helmut, to Ciba-Geigy Corporation. Nickel stabilizers for synthetic polymers. 4,186,267, Cl. 546-11.000.
Rasche, Peter: *See—*
Aign, Volker; Schulze, Hans; Bremer, Fritz; Hornle, Reinhold; Wolf, Karlheinz; Berlenbach, Wilhelm; and Rasche, Peter, 4,186,029, Cl. 106-308.00Q.
Rasmussen, John N.: *See—*
Albertson, Clarence E.; Nichols, George M.; and Rasmussen, John N., 4,186,063, Cl. 204-29.000.
Rauch, Winfried; and Schilling, Josef. Brake testing apparatus. 4,185,495, Cl. 73-126.000.
Rawlinson, John P., Jr. Chain saw gauging attachment. 4,185,382, Cl. 30-383.000.
Raymond, James W., to Reach-All Manufacturing & Engineering Co. Double cylinder over-center aerial device. 4,185,427, Cl. 52-115.000.
Raytheon Company: *See—*
Cupolo, John; Salisbury, David J.; and Ouellette, Charles W., 4,186,370, Cl. 367-4.000.
Ouellette, Charles W., 4,186,374, Cl. 367-7.000.
RCA Corporation: *See—*
Bohringer, Walter, 4,186,330, Cl. 315-411.000.
Ham, William E., 4,186,032, Cl. 134-31.000.
Shambelan, Robert C., 4,185,585, Cl. 118-50.100.
Reach-All Manufacturing & Engineering Co.: *See—*
Raymond, James W., 4,185,427, Cl. 52-115.000.
Ready Metal Manufacturing Company: *See—*
Radek, John R., 4,185,422, Cl. 52-36.000.
Readymix Cement Engineering GmbH & Co. KG: *See—*
Balster, Hugo, 4,185,956, Cl. 432-258.000.
Reber, Rufus K., to United States of America, Navy. Pressure plate mine sweep. 4,185,578, Cl. 114-245.000.
Rebsdat, Siegfried; Mayer, Sigmund; Alfranseder, Josef; and Riedl, Josef, to Hoechst Aktiengesellschaft. Process for improving the activity of used supported silver catalysts. 4,186,106, Cl. 252-414.000.
Reclamet, Inc.: *See—*
Areaux, Larry D.; and Halisek, Frank C., 4,186,096, Cl. 210-377.000.
Dudley, Robert H.; and Halisek, Frank C., 4,186,097, Cl. 210-377.000.
Redken Laboratories, Inc.: *See—*
Gumprecht, Janet A.; and Redken Laboratories, Inc., 4,186,188, Cl. 424-70.000.
Reed Ltd.: *See—*
Vit, Rudy; and Fridrich, Igor, 4,185,672, Cl. 144-312.000.
Rees, John M.; Horler, Christopher A.; and Downing, Anthony P., to Thorn Electrical Industries Limited; and Imperial Chemical Industries Limited. Method of introducing fluorine into a lamp. 4,185,922, Cl. 316-5.000.
Reese, Eckart: *See—*
Binsack, Rudolf; Reese, Eckart; Tresper, Erhard; and Wank, Joachim, 4,186,154, Cl. 525-461.000.
Regie Nationale des Usines Renault: *See—*
Robert, Bernard L., 4,185,878, Cl. 308-9.000.
Regner, Richard; and Schug, Gerd, to Hoechst Aktiengesellschaft. Apparatus for shirring casings. 4,185,358, Cl. 17-42.000.
Reichelt, Karl-Ludwig; and Trygstad, Olav E., to Nyegaard & Co. A/S. Chemical compounds. 4,186,198, Cl. 424-177.000.
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Jericho, Karl; Floymayr, Joachim; Reimpell, Uwe; and Drechsel, Dieter, 4,186,173, Cl. 422-250.000.
Reinertz, Rudolf; and Born, Wolfgang, to Grote & Hartmann GmbH & Co. KG. Process for setting an incision depth in stripping electrical conductor wires and a device for execution of the process. 4,185,522, Cl. 81-9.510.
Reinhardt, Erich K., to Schumacher'sche Fabrik GmbH & Co. KG. Filter. 4,186,101, Cl. 210-497.00R.
Reischl, Artur; Wenzel, Wolfgang; and Dieterich, Dieter, to Bayer Aktiengesellschaft. Process for the preparation of modified aqueous synthetic resin dispersions. 4,186,118, Cl. 260-29.2TN.
Reisdorf, Bartholomew G., to United States Steel Corporation. Steel with improved low temperature toughness. 4,185,998, Cl. 75-124.000.
Reiss, James M., to Atomic Products Corporation. Retractable shield for syringes. 4,185,619, Cl. 128-1.100.
Remy, Joel, to Adret Electronique. Phase locked loop frequency synthesizer and frequency modulator. 4,186,356, Cl. 332-19.000.
Republic Industries, Inc.: *See—*
Sommer, Gerhard B., 4,185,512, Cl. 74-411.500.
Research Corporation: *See—*
Gaafar, Hassan A.; and D'Arcangelis, Dora, 4,186,182, Cl. 424-1.000.
Reu Boiu, Rudolph. Sound-attenuating muffler for exhaust gases. 4,185,715, Cl. 181-266.000.
Reymann, Joseph. Automatic switching system. 4,185,561, Cl. 104-153.000.
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Barbe, Gerard; and Habault, Robert, 4,186,168, Cl. 264-168.000.
Richard Heinze Co.: *See—*
Busse, Peter, 4,185,357, Cl. 16-130.000.
Richards, Edward W., Jr., to Boeing Commercial Airplane Company. Aircraft partition mounting assembly. 4,185,799, Cl. 244-118.50R.
Richardson Company, The: *See—*
Mocas, Verlin A., 4,186,247, Cl. 429-88.000.
Richardson Graphics Company: *See—*
Muzyczko, Thaddeus M.; and Thomas, Daniel C., 4,186,069, Cl. 430-175.000.
Richey, Danny D.: *See—*
Kang, Kenneth S.; Veeder, George T., III; and Richey, Danny D., 4,186,025, Cl. 106-162.000.

Ricoh Company, Ltd.: *See—*
Noguchi, Koichi; and Hibi, Kunio, 4,186,341, Cl. 324-236.000.
Ridgway, Ian G., to University of Adelaide, The. Thresher. 4,185,642, Cl. 130-27.00R.
Riecker, Johann G.: *See—*
Schulte, Fritz; and Riecker, Johann G., 4,186,057, Cl. 202-263.000.
Riedesser, Walter, to Julius Glatz GmbH. Mouthpiece paper for cigarettes. 4,185,643, Cl. 131-12.000.
Riedl, Josef: *See—*
Rebsdat, Siegfried; Mayer, Sigmund; Alfranseder, Josef; and Riedl, Josef, 4,186,106, Cl. 252-414.000.
Riegelman, Harry M., to Rusco Industries, Inc. Locking handle for sliding doors and the like. 4,185,479, Cl. 70-95.000.
Riegler, Ernst; and Schmidt, Manfred, to Voest-Alpine Aktiengesellschaft. Arrangement for monitoring an oil supply of a lubrication system to be used for heavy machinery. 4,185,499, Cl. 73-229.000.
Riker Laboratories, Inc.: *See—*
Erickson, Edward H., 4,186,201, Cl. 424-258.000.
Riley, Leon H., to United States of America, Army. Fiber optic missile guidance and control. 4,185,796, Cl. 244-3.120.
Riley, Leon H. Fluid (liquid or gas) or electrically controlled multipurpose switch. 4,186,361, Cl. 335-179.000.
Rinehart, Ronald A., to Ladder Towers, Inc. Self closing gate. 4,185,716, Cl. 182-2.000.
Ripple, David E., to Lubrizol Corporation, The. Phosphorus-containing reaction mixture. 4,186,157, Cl. 260-948.000.
Ritchie Industries, Inc.: *See—*
Peterson, Jerry D.; and Knief, Gerald L., 4,185,589, Cl. 119-73.000.
Ritzau, William P.: *See—*
Kosik, John; and Ritzau, William P., 4,185,976, Cl. 55-373.000.
Robba, Max F.; and Aurousseau, Michel, to Innothera. Novel benzothienyl amino (propyl and butyl) ketones, a method of preparation thereof and their application to therapeutics. 4,186,136, Cl. 544-146.000.
Robeller, Walter: *See—*
Nonnenmacher, Gerhard; Robeller, Walter; Veil, Karl; and Steimann, Roland, 4,185,540, Cl. 91-497.000.
Robert, Bernard L., to Regie Nationale des Usines Renault. Hydrostatic bearing for a rotating shaft. 4,185,878, Cl. 308-9.000.
Robert Bosch GmbH: *See—*
Brammer, Hartmut; Jooss, Helmut; Kaiser, Harry; and Schellenberg, Gerhard, 4,185,600, Cl. 123-146.50A.
Misch, Wolfgang; and Kubach, Hans, 4,185,845, Cl. 280-6.00H.
Nonnenmacher, Gerhard; Robeller, Walter; Veil, Karl; and Steimann, Roland, 4,185,540, Cl. 91-497.000.
Seiler, Hartmut, 4,186,418, Cl. 361-91.000.
Sohner, Gerhard; Hohne, Gerd; Werner, Peter; Gorille, Ingo; and Roozenbeek, Herman, 4,185,603, Cl. 123-148.00E.
Ulbrich, Gerhard, 4,185,353, Cl. 15-250.360.
Roberts, Scott C., to Shell Oil Company. Pyrolysis process. 4,186,079, Cl. 208-127.000.
Robertshaw Controls Company: *See—*
Brakebill, Harold G., 4,185,772, Cl. 236-86.000.
Strachan, Robert, 4,186,284, Cl. 200-1.00A.
Stripling, Stephen J., 4,185,663, Cl. 137-882.000.
Robertson-Aikman, Alastair J. Gramophone pick-up arms. 4,185,835, Cl. 274-23.00R.
Robertson Paper Box Co., Inc.: *See—*
Davidson, Thomas L.; and Hackenberg, Robert A., 4,185,766, Cl. 229-39.00B.
Robinson, Donald W. Proximity detector. 4,186,388, Cl. 340-556.000.
Robinson, Jackie. Gutter protector assembly. 4,185,421, Cl. 52-11.000.
Robinson, John W.; and Howell, Stephen L., to Kimball International, Inc. Automatic glissando. 4,185,530, Cl. 84-1.030.
Robinson, Ralph C., to Olympian Stone Company. Building wall panel and method of making same. 4,185,437, Cl. 52-601.000.
Robinson, Thomas E.: *See—*
Benson, Paul H.; Kingdom-Hockings, Michael L.; Middleton, Brian H.; Pinnell, Martin C.; Robinson, Thomas E.; Sheeler, Richard E.; and Simmons, John, 4,186,438, Cl. 364-200.000.
Robles, Martin J.: *See—*
Schimmel, Karl F.; Sturni, Lance C.; and Robles, Martin J., 4,186,124, Cl. 260-37.0EP.
Robusto, Paul F.: *See—*
Hilton, Paul G.; Robusto, Paul F.; and Stephens, Craig P., 4,185,894, Cl. 350-338.000.
Roche, Pierre: *See—*
Basire, Alain; Roche, Pierre; and Thenard, Jean, 4,186,301, Cl. 250-204.000.
Rockwell International Corporation: *See—*
Hallford, Ben R., 4,186,352, Cl. 325-446.000.
Molina, Orlando G., 4,186,304, Cl. 250-302.000.
Roder, Albert; Mollering, Hans; Gruber, Wolfgang; Beaucamp, Klaus; Seidel, Hans; Stahl, Peter; and von Hoerschelmann, Detlef, to Boehringer Mannheim GmbH. NADH Peroxidase for hydrogen peroxide determination. 4,186,052, Cl. 435-28.000.
Rodi, Fritz: *See—*
Woditsch, Peter; Teichmann, Gunther; Linde, Gunter; Lailach, Gunter; and Rodi, Fritz, 4,186,028, Cl. 106-300.000.
Rodnyanksy, Ilya G.: *See—*
Zabava, Jury G.; Kogan, Rem N.; Lurie, Dzhan A.; Surkov, Viktor G.; Bratslavskaya, Elvira A.; Barabash, Ivan M.; Rodnyanksy, Ilya G.; Maljukyavichjus, Antanas A.; Voitenko, Egor T.; Anisovich, Gennady A.; Bevza, Vladimir F.; Tutov, Vadim I.; Grinberg, Valentin A.; Marukovich, Evgeny I.; and Senkin, Nikolai A., 4,185,684, Cl. 164-263.000.
Rodon, Maria C.: *See—*
Verdicchio, Robert J.; and Rodon, Maria C., 4,186,113, Cl. 252-526.000.
Rodriquez, Rodolfo R.: *See—*
Cullis, Herbert M.; DeVries, James H.; Lohr, David A.; Rodriquez, Rodolfo R.; and Uffer, Michael B., 4,185,629, Cl. 128-214.00R.
Rody, Jean: *See—*
Rasberger, Michael; Rody, Jean; Moser, Paul; and Muller, Helmut, 4,186,267, Cl. 546-11.000.
Roeloffzen, Johannes F. Method of manufacturing base plates suitable for pressing records and plates manufactured by the same. 4,186,229, Cl. 428-65.000.
Roepnack, Alan N. Bale injection system. 4,185,549, Cl. 100-45.000.
Roes, John B.; and Moore, Royal C., to Cubic Western Data. Magnetically encoded token and handling apparatus. 4,185,730, Cl. 194-4.00R.
Rogers, Brian H.; and Thring, Robin H., to Normalair-Garrett (Holdings) Limited. Environmental control systems. 4,185,469, Cl. 62-174.000.
Rogers, Walter C., Jr. Two-way wall-avoiding recliner chair. 4,185,869, Cl. 297-84.000.
Rohm and Haas Company: *See—*
Agui, Wataru; Higosaki, Nobuyuki; Yamanari, Koichiro; Furukawa, Toshio; and Kuyama, Hiroshi, 4,186,167, Cl. 264-141.000.
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,185,995, Cl. 71-124.000.
Rohr Industries, Inc.: *See—*
Dickenson, Robert, 4,185,798, Cl. 244-110.00B.
Rohrer, Douglas D., to Eaton Corporation. Fluid coupling device and bimetal coil mounting arrangement. 4,185,726, Cl. 192-58.00B.
Rohrman, Frederick A.: *See—*
Anderson, Richard K.; and Rohrman, Frederick A., 4,185,554, Cl. 102-18.0MS.
Roley, Robert D., to Caterpillar Tractor Co. Sprocket wear template. 4,185,391, Cl. 33-168.00R.
Rolls-Royce (1971) Limited: *See—*
Sellars, Hubert D.; Mills, David; and Ford, Michael F. J., 4,186,222, Cl. 427-134.000.
Romine, Donald J.; Davis, Donald C.; Woodruff, Phillip R.; Young, Ching T.; Bode, James D.; and Tien, Tseng Y., to Bendix Autolite Corporation. Process for producing oxygen gas sensor elements. 4,186,071, Cl. 204-195.00S.
Rondina, Alfred J., Jr.: *See—*
Morse, Robert A., II; and Rondina, Alfred J., Jr., 4,185,462, Cl. 60-261.000.
Roozenbeek, Herman: *See—*
Sohner, Gerhard; Hohne, Gerd; Werner, Peter; Gorille, Ingo; and Roozenbeek, Herman, 4,185,603, Cl. 123-148.00E.
Rose, Harold W.: *See—*
Williamson, Tommy L.; and Rose, Harold W., 4,185,919, Cl. 356-141.000.
Rose, John B.: *See—*
Freeman, John L.; and Rose, John B., 4,186,262, Cl. 528-125.000.
Roselon Industries, Inc.: *See—*
Juckenbach, Roy, 4,185,364, Cl. 28-218.000.
Ross, Hilda: *See—*
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.
Ross, Howard, Jr.: *See—*
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.
Ross, Howard, Sr.: *See—*
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.
Ross, John D.: *See—*
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.
Ross, Joseph A.: *See—*
DiMatteo, Paul L.; Ross, Joseph A.; and Stern, Howard K., 4,185,918, Cl. 356-375.000.
Ross, Thomas B. Frame construction for making round comb honey. 4,185,343, Cl. 6-10.000.
Ross, Vante B.: *See—*
Carlsson, Per A. E.; Carnmalm, Bernt S. E.; Ross, Vante B.; and Ulff, Carl B. J., 4,186,202, Cl. 424-263.000.
Ross, William J.: *See—*
Harrison, Roger G.; Jamieson, William B.; Ross, William J.; and Saunders, John C., 4,186,204, Cl. 424-269.000.
Rossville Mills, Inc.: *See—*
Kendrick, Edd H., 4,185,667, Cl. 139-302.000.
Rotenberg, Don H.; Cuffe, Patricia M.; and Laurin, Bernard L., to American Optical Corporation. Abrasion-resistant coating composition. 4,186,026, Cl. 106-287.140.
Roth, Eldon N. Method for deboning meat. 4,186,216, Cl. 426-480.000.
Rothkegel, Bernhard: *See—*
Scherbaum, Rudolf; Rothkegel, Bernhard; and Schreiner, Horst, 4,185,968, Cl. 51-316.000.
Roussel UCLAF: *See—*
Warnant, Julien; and Jolly, Jean, 4,186,128, Cl. 260-239.500.
Rowe, Edward A., Jr.: *See—*
Cawley, William H.; and Rowe, Edward A., Jr., 4,186,035, Cl. 148-6.160.
Rubens, Louis C., to Dow Chemical Company, The. Foamed radiation-crosslinked high density polyethylenes. 4,186,068, Cl. 204-159.200.
Rulie, Otto: *See—*
Webermeier, Kurt; Wissinger, Waldemar; and Rulie, Otto, 4,185,951, Cl. 425-133.500.

Rumbaugh, James T.: *See*—
Mize, Charles J.; and Rumbaugh, James T., 4,186,239, Cl. 428-399.000.
Rusco Industries, Inc.: *See*—
Riegelman, Harry M., 4,185,479, Cl. 70-95.000.
Rusth, Douglas B.; and Martin, David A. Air circulator. 4,185,545, Cl. 98-33.00A.
S&C Electric Company: *See*—
Fahnoe, Harold H., 4,186,365, Cl. 337-206.000.
Saccoccio, Nazareno J., to Aro-Sac Inc. Ear clip having pivoted arms held by friction. 4,185,471, Cl. 63-14.00C.
Sachs, Hermann W.; Marek, Peter; and Dorner, Florian, to Bayer Aktiengesellschaft. Adjustable dose pistol-type applicator. 4,185,755, Cl. 222-43.000.
Safety Research & Engineering Corporation: *See*—
Barabino, William A., 4,186,377, Cl. 340-58.000.
Saint-Gobain Industries: *See*—
Chiron, Georges, 4,186,220, Cl. 427-8.000.
St. Jean, Gerard: *See*—
Ewart, James M.; Anderson, Clay H.; and St. Jean, Gerard, 4,185,513, Cl. 74-425.000.
Saito, Makoto, to Oki Electric Industry Co., Ltd. Vibration detector. 4,185,503, Cl. 73-653.000.
Sakaguchi, Sanae: *See*—
Imada, Kunihiko; Ohtake, Katsumasa; Ohshima, Taizo; and Sakaguchi, Sanae, 4,185,959, Cl. 8-26.000.
Sakamaki, Hisashi: *See*—
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,185,909, Cl. 355-15.000.
Sakashita, Kazumi; Hiratsuka, Kenji; Umezu, Yutaka; Nakamura, Nobuo; and Noda, Haruhisa, to Dai Nippon Toryo Company. Light transmissible high density elastic resin composition. 4,186,234, Cl. 428-283.000.
Sakurada, Satoshi: *See*—
Itoh, Takuji; Sakurada, Satoshi; Okano, Shohei; Obayashi, Takashi; Toyoizumi, Takeo; and Iwata, Osami, 4,186,078, Cl. 208-27.000.
Salamon, Theodore M., to General Motors Corporation. Passive seat belt system. 4,185,855, Cl. 280-804.000.
Salisbury, David J.: *See*—
Cupolo, John; Salisbury, David J.; and Ouellette, Charles W., 4,186,370, Cl. 367-4.000.
Salmon, Emigdio J., to Phillips Petroleum Company. Solvent removal from polymer solutions. 4,186,047, Cl. 159-2.00E.
Salomon, Georges P. J., to Etablissements Francois Salomon et Fils. Pivoting safety binding for ski. 4,185,851, Cl. 280-613.000.
Salvador, Anthony R.: *See*—
Neves, William T.; and Salvador, Anthony R., 4,185,650, Cl. 137-15.000.
Salzmann, Heinz: *See*—
Kunitz, Friedrich-Wilhelm; and Salzmann, Heinz, 4,186,019, Cl. 430-557.000.
Sanders Associates, Inc.: *See*—
Mortimer, Thomas J., 4,186,413, Cl. 358-146.000.
Sanders, David E.: *See*—
Gordy, Robert S.; Chambers, Ramon P.; and Sanders, David E., 4,186,349, Cl. 325-323.000.
Sanders, James M.: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,186,150, Cl. 260-586.00G.
Sanderson, Albert M.: *See*—
Bache, John K.; Sanderson, Albert M.; and Pearson, Arthur, 4,186,039, Cl. 148-128.000.
Sandoz, Inc.: *See*—
Bruner, James D., 4,185,638, Cl. 128-349.00B.
Yearian, William C., 4,186,195, Cl. 424-93.000.
Sandoz Ltd.: *See*—
Canela, Jose; and Gerber, Hans, 4,186,119, Cl. 260-29.2TN.
Gerber, Hans; Grueninger, Erwin; Koch, Werner; and Somm, Franz, 4,185,962, Cl. 8-171.000.
Sands, Matthew L.: *See*—
Keithley, Joseph F.; and Sands, Matthew L., 4,185,556, Cl. 102-18.00M.
Sandvoss, Werner E.: *See*—
Sherlock, Hugh P.; Ewry, Edwin E.; Sandvoss, Werner E.; Ciupke, Werner W.; Brown, Glenn E.; and Link, William T., 4,185,899, Cl. 352-72.000.
Sankyo Kogaku Kogyo Kabushiki Kaisha: *See*—
Kozakai, Masahiro, 4,186,300, Cl. 250-204.000.
Sanyo Electric Co., Ltd.: *See*—
Ohashi, Tadamasa, 4,186,360, Cl. 334-55.000.
Saracco, Raymond F., to Koppers Company, Inc. Pipe coupling compensating device. 4,185,857, Cl. 285-363.000.
Sarazen, Philip R. Welder's shield for electric arc welding. 4,185,329, Cl. 2-8.000.
Sargent, Frank T.; Antos, John M.; Henke, Arthur W.; Embach, James T.; Butler, Frederick A.; and Lindsay, Erin J., to Thetford Corporation. Portable toilet with improved flush apparatus. 4,185,337, Cl. 4-300.000.
Sargent, Frank T.; Henke, Arthur W.; Antos, John M.; and Cameron, John T., to Thetford Corporation. Toilet apparatus. 4,185,340, Cl. 4-441.000.
Sartell, Ripley B., Jr. Portable bicycle tire air system. 4,185,670, Cl. 141-94.000.
Sasakura, Kazuyuki: *See*—
Sugasawa, Tsutomu; Toyoda, Tatsuo; Sasakura, Kazuyuki; Ueda, Shiro; Takase, Akira; Okuno, Katsuto; Ishizuka, Ichiro; and Sumimoto, Shinzaburo, 4,186,144, Cl. 260-465.100.
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. 4,5-Dichloro-imidazole derivatives and their use as herbicides. 4,185,991, Cl. 71-92.000.
Sato, Sigeru: *See*—
Mizusawa, Motoo; Kinoshita, Chikao; Betsudan, Shinichi; and Sato, Sigeru, 4,186,402, Cl. 343-781.0CA.
Saturn Machine & Welding Co., Inc.: *See*—
Baird, William R.; Sutton, Kenneth O.; and Baird, Billy C., 4,186,055, Cl. 202-248.000.
Saunders, John C.: *See*—
Harrison, Roger G.; Jamieson, William B.; Ross, William J.; and Saunders, John C., 4,186,204, Cl. 424-269.000.
Savage, David W., to Exxon Research & Engineering Co. Suspension of powdered carbonaceous adsorbent in a hydrocarbon solvent and its use in waste water treatment. 4,186,085, Cl. 210-27.000.
Saveliev, Jury V.: *See*—
Shirokov, Vasily I.; Maljutin, Gennady G.; Mishiev, Iliasaf I.; and Saveliev, Jury V., 4,185,977, Cl. 62-23.000.
Savkar, Sudhir D., to General Electric Company. Fuel pulsation-suppression for gas turbine combustion system. 4,185,455, Cl. 60-39.060.
Scales, John T., to Institute of Orthopaedics, The. Support appliance. 4,185,341, Cl. 5-461.000.
Scaletta, Joseph A.: *See*—
Miller, Roland E.; Scaletta, Joseph A.; and Valek, John, 4,185,488, Cl. 72-350.000.
Schaevitz Engineering: *See*—
Hartzell, Robert E., Jr., 4,186,324, Cl. 310-329.000.
Schafer, David E.: *See*—
Houbion, John A.; and Schafer, David E., 4,185,989, Cl. 71-88.000.
Schar, Meinrad; and Schellenberg, Matthias, to Ciba-Geigy Aktiengesellschaft. Method for processing silver dye-bleach materials. 4,186,008, Cl. 430-393.000.
Scharf, Donald R., to Nordson Corporation. Exhaust for an opening into a coater. 4,185,975, Cl. 55-238.000.
Schellenberg, Gerhard: *See*—
Brammer, Hartmut; Jooss, Helmut; Kaiser, Harry; and Schellenberg, Gerhard, 4,185,600, Cl. 123-146.50A.
Schellenberg, Matthias: *See*—
Schar, Meinrad; and Schellenberg, Matthias, 4,186,008, Cl. 430-393.000.
Scherbaum, Rudolf; Rothkegel, Bernhard; and Schreiner, Horst, to Siemens Aktiengesellschaft. Method for generating a solderable surface on a contact piece of silver and finely distributed graphite particles. 4,185,968, Cl. 51-316.000.
Schering Aktiengesellschaft: *See*—
Huth, Andreas; Schmiechen, Ralph; Kehr, Wolfgang; Paschelke, Gert; Wachtel, Helmut; Schneider, Herbert H.; and Palenschat, Dieter, 4,186,129, Cl. 548-186.000.
Scheuermann, Fanny: *See*—
Zeidler, Ulrich; and Scheuermann, Fanny, 4,186,207, Cl. 424-284.000.
Schick, John W.; Davis, Robert H.; and Andress, Harry J., to Mobil Oil Corporation. Lubricant compositions for can forming. 4,185,485, Cl. 72-42.000.
Schiff, Robert A.; and Holladay, John T., to Packaging Corporation of America. Shipping container and blank therefor. 4,185,741, Cl. 206-326.000.
Schiffers, Albert, Jr. Anchor clamp for serrated grating. 4,185,435, Cl. 52-507.000.
Schilling, Josef: *See*—
Rauch, Winfried; and Schilling, Josef, 4,185,495, Cl. 73-126.000.
Schimmel, Karl F.; Sturni, Lance C.; and Robles, Martin J., to PPG Industries, Inc. Novel pigment grinding vehicle. 4,186,124, Cl. 260-37.0EP.
Schirneker, Hans L. Candle lamp with carrier wick. 4,185,953, Cl. 431-291.000.
Schirrich, Klaus: *See*—
Hars, Christoph; Schirrich, Klaus; Steinmeier, Bodo; and Tappe, Wilfried, 4,185,879, Cl. 308-20.000.
Schlicht, Raymond C.; and Cummings, William M., to Texaco Inc. Amine derivatives of hydrocarbyl lactam carboxylic acids as fuel additives. 4,185,965, Cl. 44-63.000.
Schlichte, Max, to Siemens Aktiengesellschaft. PCM TDM switching network. 4,186,276, Cl. 179-15.0AT.
Schlichte, Max, to Siemens Aktiengesellschaft. Time division multiplex telecommunications switching network. 4,186,277, Cl. 179-15.0AT.
Schlobohm, Arnold: *See*—
Stoller, Patricia S.; Hammonds, James C.; Kloepper, John O.; and Schlobohm, Arnold, 4,185,564, Cl. 410-64.000.
Schmidlkofer, Jakob: *See*—
Pirson, Ewald; and Schmidlkofer, Jakob, 4,186,104, Cl. 252-358.000.
Schmidt, John, Jr.; and Martin, Donald E., to Eaton Corporation. Solenoid assembly for elevated temperature service. 4,186,363, Cl. 335-278.000.
Schmidt, Manfred: *See*—
Riegler, Ernst; and Schmidt, Manfred, 4,185,499, Cl. 73-229.000.
Schmidt, Robert R.: *See*—
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,185,991, Cl. 71-92.000.

Schmidt, Robert R., III; and Holmes, Jerry D., to Eastman Kodak Company. Substantially amorphous polyolefins useful as pressure-sensitive adhesives. 4,186,258, Cl. 525-342.000.

Schmidt, William M.; Thorwaldsen, Stanley E.; McElroy, David C.; and Miggels, Stephen G., to Allis-Chalmers Corporation. Harvester with a laterally extending visor structure. 4,185,867, Cl. 296-187.000.

Schmiechen, Ralph: *See*—
Huth, Andreas; Schmiechen, Ralph; Kehr, Wolfgang; Paschelke, Gert; Wachtel, Helmut; Schneider, Herbert H.; and Palenschat, Dieter, 4,186,129, Cl. 548-186.000.

Schneider, Herbert H.: *See*—
Huth, Andreas; Schmiechen, Ralph; Kehr, Wolfgang; Paschelke, Gert; Wachtel, Helmut; Schneider, Herbert H.; and Palenschat, Dieter, 4,186,129, Cl. 548-186.000.

Scholl, Inc.: *See*—
Digate, James S., 4,185,402, Cl. 36-44.000.

Scholz, Rainer, to Audi Nsu Auto Union Aktiengesellschaft. Monolithic catalytic muffler having nondeposit welds. 4,186,172, Cl. 422-180.000.

Schotsman, Simon C. Multislide holder and editor and cabinet therefor. 4,185,406, Cl. 40-361.000.

Schreiber, William L.: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,186,150, Cl. 260-586.00G.

Schreier, Ulrich: *See*—
Dumesnil, Maurice E.; and Schreier, Ulrich, 4,186,023, Cl. 106-53.000.

Schreiner, Horst: *See*—
Scherbaum, Rudolf; Rothkegel, Bernhard; and Schreiner, Horst, 4,185,968, Cl. 51-316.000.

Schug, Gerd: *See*—
Regner, Richard; and Schug, Gerd, 4,185,358, Cl. 17-42.000.

Schulte, Fritz; and Riecker, Johann G., to Hartung, Kuhn & Co. Maschinenfabrik GmbH. Gas extracting and purifying equipment. 4,186,057, Cl. 202-263.000.

Schulte, Willi: *See*—
Heimke, Gunther; and Schulte, Willi, 4,185,383, Cl. 433-173.000.

Schultz, Robert S. Collapsible dispensing tube having an anchored barrier member. 4,185,757, Cl. 222-107.000.

Schulze, Hans: *See*—
Aign, Volker; Schulze, Hans; Bremer, Fritz; Hornle, Reinhold; Wolf, Karlheinz; Berlenbach, Wilhelm; and Rasche, Peter, 4,186,029, Cl. 106-308.00Q.

Schumacher'sche Fabrik GmbH & Co. KG: *See*—
Reinhardt, Erich K., 4,186,101, Cl. 210-497.00R.

Schwaab, Konstantin: *See*—
Kleinschmidt, Johann O.; and Schwaab, Konstantin, 4,185,570, Cl. 112-121.260.

Schwab, Carl E.; and Hutter, Joseph A., to General Signal Corporation. Goniometer circuit for VOR system. 4,186,399, Cl. 343-102.000.

Schwartz, Cindy Sue: *See*—
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.

Schwartz, Richard A.: *See*—
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.

Schwartz, Robert D.: *See*—
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.

Schwartz, Theodore F., to Schwartz, Theodore F.; Hayt, Lester J., Sr.; Yost, William H.; Hall, Gail M.; Hayt, Lester J., Jr.; Hayt, Nancy J.; Butts, Michelle J.; Hall, Ray R.; Hall, Gary; Hall, Philip; Bouher, Caroline; Ross, Hilda; Ross, Howard, Sr.; Ross, Howard, Jr.; Seal, Marilyn; Ross, John D.; Schwartz, Richard A.; Lagardere, Josette M.; Lagardere, Josette; Lagardere, John R.; Newton, George; Burnette, Camilla M.; Troupe, Emily Jean; Ferrin, S. Paul; Ehrenreich, Arthur D.; Schwartz, Robert D.; Masterson, Penny Lee; Fischer, Cathy Jo; Schwartz, Cindy Sue; Serrett, Jacquie L.; Grubb, Daniel; Gary, Bette M.; Bronstein, Leonard; Toth, Theodore S.; and Brown, Kenneth M. Photographic developer and printer. 4,185,912, Cl. 355-28.000.

Schwartz, William. Log burning device. 4,185,613, Cl. 126-181.000.

Schwenninger, Ronald L., to PPG Industries, Inc. Method of measuring temperature of a sheet with a noncontacting-type pyrometer. 4,185,982, Cl. 65-29.000.

Sciamonte, Philip A., to American Flange & Manufacturing Co. Dispensing package and method. 4,185,756, Cl. 222-83.500.

SCM Corporation: *See*—
Fitch, Steven J.; Peeling, Philip R.; and Heiser, David J., 4,186,088, Cl. 210-45.000.

Scott, Allen W., to General Electric Company. Switch operating assembly including a self-adjusting arrangement. 4,186,287, Cl. 200-61.620.

Seaberg, Richard D., to Cascade Corporation. Slide structure for parallel arm clamps and the like. 4,185,944, Cl. 414-621.000.

Seal, Marilyn: *See*—
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.

Sealer Air Corporation: *See*—
Geise, Howard F., 4,186,256, Cl. 521-155.000.

Seals Eastern Inc.: *See*—
Hertz, Daniel L., Jr., 4,185,840, Cl. 277-125.000.

Sears, Roebuck and Co.: *See*—
Gall, John C.; Batogowski, Joseph H.; and Chamberlain, Albert F., 4,185,400, Cl. 35-5.000.

Second Foundation: *See*—
Proudian, Andrew P.; and Nagy, Arthur E., 4,185,501, Cl. 73-641.000.

Sedlatschek, Robert: *See*—
Totino, Peter J.; and Sedlatschek, Robert, 4,185,574, Cl. 112-225.000.

Seese, Robert G.; Fitzgibbon, Alan; and Slish, Frank, to Union Carbide Corporation. Barium-strontium-silicon-aluminum master alloy. 4,185,999, Cl. 75-148.000.

Seidel, Hans: *See*—
Roder, Albert; Mollering, Hans; Gruber, Wolfgang; Beaucamp, Klaus; Seidel, Hans; Stahl, Peter; and von Hoerschelmann, Detlef, 4,186,052, Cl. 435-28.000.

Seiler, Hartmut, to Robert Bosch GmbH. Overvoltage protected integrated circuit network, to control current flow through resistive or inductive loads. 4,186,418, Cl. 361-91.000.

Seitz, Hermann H., to Infra-Vision AG Zug. Device for projecting a film picture. 4,185,898, Cl. 352-69.000.

Sellars, Hubert D.; Mills, David; and Ford, Michael F. J., to Rolls-Royce (1971) Limited. Mould insulation. 4,186,222, Cl. 427-134.000.

Semco Instruments, Inc.: *See*—
Moore, M. Samuel; and Paluka, Charles F., 4,185,460, Cl. 60-224.000.

Senkin, Nikolai A.: *See*—
Zabava, Jury G.; Kogan, Rem N.; Lurie, Dzhan A.; Surkov, Viktor G.; Bratslavskaya, Elvira A.; Barabash, Ivan M.; Rodnyanksy, Ilya G.; Maljukyavichjus, Antanas A.; Voitenko, Egor T.; Anisovich, Gennady A.; Bevza, Vladimir F.; Tutov, Vadim I.; Grinberg, Valentin A.; Marukovich, Evgeny I.; and Senkin, Nikolai A., 4,185,684, Cl. 164-263.000.

Sera, Toshikuni: *See*—
Atsukawa, Masumi; Nishimoto, Yoshihiko; Yokoyama, Naruo; and Sera, Toshikuni, 4,186,109, Cl. 252-440.000.

Serrett, Jacquie L.: *See*—
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.

Shalaby, Shalaby W.; and Jamiolkowski, Dennis D., to Ethicon, Inc. Absorbable pharmaceutical compositions based on poly(alkylene oxalates). 4,186,189, Cl. 424-78.000.

Shambelan, Robert C., to RCA Corporation. Apparatus for simultaneously processing a plurality of substrates. 4,185,585, Cl. 118-50.100.

Sharp Kabushiki Kaisha: *See*—
Tateishi, Iwao, 4,185,390, Cl. 33-139.000.
Umeda, Ikuo; Aiba, Masahiko; and Kimura, Kozo, 4,185,930, Cl. 400-320.000.

Shaw, David N., to Dunham-Bush, Inc. Multi-step regenerated organic fluid helical screw expander hermetic induction generator system. 4,185,465, Cl. 60-678.000.

Shaw, Robert F. Surgical instrument having self-regulated electrical skin-depth heating of its cutting edge and method of using the same. 4,185,632, Cl. 128-303.100.

Sheeler, Richard E.: *See*—
Benson, Paul H.; Kingdom-Hockings, Michael L.; Middleton, Brian H.; Pinnell, Martin C.; Robinson, Thomas E.; Sheeler, Richard E.; and Simmons, John, 4,186,438, Cl. 364-200.000.

Shell Oil Company: *See*—
Roberts, Scott C., 4,186,079, Cl. 208-127.000.

Shepley, Paul E. Method of stringing a two wheel compound archery bow. 4,185,374, Cl. 29-434.000.

Sherer, Charles R. Method of and apparatus for cutting substantially vertically disposed pipe. 4,185,525, Cl. 82-4.00C.

Sherlock, Hugh P.; Ewry, Edwin E.; Sandvoss, Werner E.; Ciupke, Werner W.; Brown, Glenn E.; and Link, William T., to Action Films, Inc. Combination viewer and projector. 4,185,899, Cl. 352-72.000.

Shibata, Toshihiro: *See*—
Kubota, Naohiro; Shibata, Toshihiro; and Sugibuchi, Kazuo, 4,186,151, Cl. 260-591.000.

Shiga, Shujiro; Katsumata, Takeshi; Okamoto, Yasushi; and Higasa, Tadashi, to Sumitomo Chemical Company, Limited. Method for catalytically reducing nitrogen oxides using moving catalyst bed reactor. 4,186,177, Cl. 423-239.000.

Shimura, Noriaki; and Mizuno, Yutaka, to Casio Computer Co., Ltd. Electronic cash register for totalizing sales data on a time zone basis. 4,186,439, Cl. 364-405.000.

Shiomi, Masanao; and Miyoshi, Shigetoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Structure for supporting a steering column main shaft. 4,185,880, Cl. 308-189.00R.

Shionogi & Co., Ltd.: *See*—
Sugasawa, Tsutomu; Toyoda, Tatsuo; Sasakura, Kazuyuki; Ueda, Shiro; Takase, Akira; Okuno, Katsuto; Ishizuka, Ichiro; and Sumimoto, Shinzaburo, 4,186,144, Cl. 260-465.100.

Shippy, Ronald L.: *See*—
Powell, Joe A.; Messerly, James W.; and Shippy, Ronald L., 4,186,042, Cl. 156-115.000.

Shirin, Vladimir S.: *See*—
Ksendzyk, Georgy V.; Frumin, Isidor I.; and Shirin, Vladimir S., 4,185,682, Cl. 164-252.000.

Shirokov, Vasily I.; Maljutin, Gennady G.; Mishiev, Iliasaf I.; and Saveliev, Jury V. Method of and apparatus for producing hydrogen. 4,185,977, Cl. 62-23.000.

Shoenberger, Ronald W.: *See*—
Brayton, William E.; Fun, Fay; Hendrickson, Luther G.; and Shoenberger, Ronald W., 4,186,054, Cl. 201-6.000.

Shop-Vac Corporation: *See*—
Hiester, Kenneth R., 4,185,974, Cl. 55-216.000.

Shtanko, Jury P.: *See—*
Medovar, Boris I.; Artamonov, Viktor L.; Bogachenko, Alexei G.; Shtanko, Jury P.; Bondarenko, Oleg P.; Eltsov, Konstantin S.; Stetsenko, Nikolai V.; Popov, Sergei S.; Kaganovsky, Gary P.; and Korotkov, Albert N., 4,185,683, Cl. 164-252.000.

Shuster, Edward J.: *See—*
Hall, John B.; Hruza, Denis E., Sr.; Shuster, Edward J.; Vock, Manfred H.; and Vinals, Joaquin F., 4,186,103, Cl. 252-174.110.
Light, Kenneth K.; Spencer, Bette M.; Vinals, Joaquin F.; Kiwala, Jacob; Vock, Manfred H.; and Shuster, Edward J., 4,186,149, Cl. 260-586.00R.
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,186,150, Cl. 260-586.00G.

Siedlar, Adam: *See—*
Pawlik, Kazimierz; Janikowska-Pawlik, Jadwiga; and Siedlar, Adam, 4,185,708, Cl. 175-410.000.

Siemens Aktiengesellschaft: *See—*
Baier, Erich; and Hahn, Hans, 4,185,907, Cl. 355-3.00R.
Chakrabarty, Naresh; Einzinger, Richard; and Weitze, Artur, 4,186,367, Cl. 338-21.000.
Frie, Wolfgang; and Henkel, Hans-Joachim, 4,185,966, Cl. 48-212.000.
Guenther, Gerd J., 4,185,931, Cl. 400-705.000.
Muhlberg, Erhard, 4,185,595, Cl. 123-3.000.
Scherbaum, Rudolf; Rothkegel, Bernhard; and Schreiner, Horst, 4,185,968, Cl. 51-316.000.
Schlichte, Max, 4,186,276, Cl. 179-15.0AT.
Schlichte, Max, 4,186,277, Cl. 179-15.0AT.

Sihon, Tanas M.: *See—*
Ford, Harry S., Jr.; Hamparian, Nshan; and Sihon, Tanas M., 4,185,717, Cl. 184-6.280.

Silhankova, Ludmila, to Vysoka skola chemicko-technologicka. Method for preparation of vitamin B1. 4,186,252, Cl. 435-120.000.

Silvestri, Anthony J.: *See—*
Mikovsky, Richard J.; and Silvestri, Anthony J., 4,186,080, Cl. 208-143.000.

Silvia, Alfred D.: *See—*
Waclawik, Francis J.; Muzaca, James P.; Cook, Robert A.; Hardin, William A.; Silvia, Alfred D.; and Correia, Ronald, 4,185,345, Cl. 9-8.00R.

Simmonds, James F., to Perkins Research & Manufacturing Co., Inc. Test set. 4,186,283, Cl. 179-175.30R.

Simmons, John: *See—*
Benson, Paul H.; Kingdom-Hockings, Michael L.; Middleton, Brian H.; Pinnell, Martin C.; Robinson, Thomas E.; Sheeler, Richard E.; and Simmons, John, 4,186,438, Cl. 364-200.000.

Simmons, William D.: *See—*
York, Ray A.; and Simmons, William D., 4,185,542, Cl. 92-166.000.

Simor, Anton A., to Den-tal-ez of Canada Ltd. Control system for dental drills. 4,185,385, Cl. 32-22.000.

Sims, Bobby H. Apparatus for monitoring and controlling liquid level. 4,186,419, Cl. 361-178.000.

Sinay, Pierre: *See—*
Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,186,194, Cl. 424-89.000.

Sinclair, Edward A.; and Kalbfleisch, John M., to Goodyear Tire & Rubber Company, The. Thermoplastic moldable latex foam mat. 4,186,230, Cl. 428-95.000.

Sinelnikov, Sergei V.: *See—*
Ordanian, Sergei S.; Lysanov, Vladislav S.; Digonsky, Viktor V.; Blinkov, Vadim A.; Pekelis, Ljubov A.; Denisova, Vera I.; Unrod, Vladimir I.; Sinelnikov, Sergei V.; and Chestnokova, Marina P., 4,186,022, Cl. 106-43.000.

Singer Company, The: *See—*
Brown, Jack; Herr, John; Peterson, Wesley R.; and Wurst, John W., 4,185,575, Cl. 112-277.000.
Ketterer, Stanley J., 4,185,572, Cl. 112-158.00E.
Laermer, Lothar, 4,186,422, Cl. 361-388.000.
Minalga, Philip F., 4,185,571, Cl. 112-158.00B.
Totino, Peter J.; and Sedlatschek, Robert, 4,185,574, Cl. 112-225.000.

Singh, Gurdial, to Superior Electric Company, The. Shaped rotor teeth for stepping motors. 4,186,316, Cl. 310-49.00R.

SINTEF (Selskapet for industriell og teknisk forskning ved NTH): *See—*
Ugelstad, John, 4,186,120, Cl. 260-29.6RB.

Sisk, Hollis D. Endplate with cast-in baffle. 4,186,317, Cl. 310-60.00R.

Sjoman, Karl O.: *See—*
Nordin, Elling H.; and Sjoman, Karl O., 4,185,386, Cl. 433-82.000.

Skach, Edward J., Jr.; and Cobel, George B., to Dow Chemical Company, The. Salt-coated magnesium granules. 4,186,000, Cl. 75-0.50B.

SKF Nova AB: *See—*
Lundgren, Bengt, 4,186,125, Cl. 260-42.180.

Skylawn: *See—*
Bondi, Herman H., 4,185,860, Cl. 292-148.000.

Slater, Paul: *See—*
Burford, John R.; and Slater, Paul, 4,185,635, Cl. 128-330.000.

Slish, Frank: *See—*
Seese, Robert G.; Fitzgibbon, Alan; and Slish, Frank, 4,185,999, Cl. 75-148.000.

Slocombe, Hugo T. Self-stabilizing multiple sling system and method. 4,185,862, Cl. 294-74.000.

Smathers, Helen A. Arithmetic game board. 4,185,401, Cl. 35-31.00C.

Smith, Dudley C.: *See—*
Blackburn, James R.; and Smith, Dudley C., 4,185,511, Cl. 74-242.14R.

Smith, Eugene C.: *See—*
Wilkes, Robert D.; Smith, Eugene C.; and Ufford, David E., 4,185,655, Cl. 137-315.000.

Smith, Eugene L., Jr.: *See—*
Wang, Samuel S.; Smith, Eugene L., Jr.; and Huliganga, Ernie F., 4,186,083, Cl. 209-166.000.

Smith, George B.: *See—*
Bonsall, Peter C.; Morrison, James W.; Nicholson, Eric S.; Smith, George B.; and Townley, Kenneth G., 4,186,105, Cl. 252-400.00R.

Smith, Gordon D., Jr.: *See—*
Miller, Leo C.; Perschy, James A.; and Smith, Gordon D., Jr., 4,186,440, Cl. 364-900.000.

Smith International, Inc.: *See—*
Baker, William, III; and Vincent, Joe W., 4,185,706, Cl. 175-340.000.

Smith, Jack L.; and Mitchell, Leon W., to American Can Company. Method of coating the interior surfaces of a hollow article. 4,186,225, Cl. 427-233.000.

Smith, Kenneth E.: *See—*
Hatcher, Charles S.; and Smith, Kenneth E., 4,185,451, Cl. 57-310.000.

Smith, Richard C.; and Kanter, Ira E., to Westinghouse Electric Corp. Exclusion of alpha particles from thoron in uranium detection. 4,186,303, Cl. 250-253.000.

Smith, Robert L., to Chemetron Corporation. Scraped-surface apparatus. 4,185,352, Cl. 15-246.500.

Smith, Timothy J. C., to Union Carbide Corporation. Autodeposited coatings with increased surface slip. 4,186,226, Cl. 427-340.000.

SmithKline Corporation: *See—*
Bender, Paul E., 4,186,205, Cl. 424-273.00R.

Smoky Mountain Enterprises, Inc.: *See—*
Buckner, Carrol E., 4,185,610, Cl. 126-121.000.

Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A.: *See—*
Moruzzi, Pietro; and Cadau, Francesco, 4,185,450, Cl. 57-247.000.

S.A. des Etablissements NEU: *See—*
Duchene, Alain; Malet, Jean-Claude; and Neu, Francis, 4,185,780, Cl. 239-553.500.

Societe des Acieries de Paris et D'Outreau: *See—*
Blanc, Pierre; and Perrot, Robert, 4,185,773, Cl. 238-150.000.

Societe D'Etudes Scientifiques et Industrielles de L'ile-de-France: *See—*
Thominet, Michel; Bulteau, Gerard; Acher, Jacques; and Collignon, Claude, 4,186,135, Cl. 260-326.340.

Societe Dite: Institut de Recherches Chimiques et Biologiques Appliquees-I.R.C.E.B.A.: *See—*
Debat, Jacques, 4,186,211, Cl. 424-343.000.

Societe Lignes Telegraphiques et Telephoniques: *See—*
Forterre, Gerard; and Marcoux, Jean, 4,186,357, Cl. 333-24.100.

Societe Suisse pour l'Industrie Horlogere Management Services S.A.: *See—*
Jaunin, Jean-Pierre, 4,185,453, Cl. 58-35.00R.

Soeda, Takahiko: *See—*
Gomi, Teruo; Hisa, Yuji; and Soeda, Takahiko, 4,186,218, Cl. 426-598.000.

Sogi, Toshiyuki: *See—*
Motomura, Kenichi; Yahagi, Mitsuhisa; and Sogi, Toshiyuki, 4,185,677, Cl. 152-362.00R.

Sohner, Gerhard; Hohne, Gerd; Werner, Peter; Gorille, Ingo; and Roozenbeek, Herman, to Robert Bosch GmbH. Supply voltage variation compensated ignition system for an internal combustion engine. 4,185,603, Cl. 123-148.00E.

Solarcrete Corporation: *See—*
Graham, Douglas L., 4,185,924, Cl. 366-10.000.

Solid Photography Inc.: *See—*
DiMatteo, Paul L.; Ross, Joseph A.; and Stern, Howard K., 4,185,918, Cl. 356-375.000.

Somm, Franz: *See—*
Gerber, Hans; Grueninger, Erwin; Koch, Werner; and Somm, Franz, 4,185,962, Cl. 8-171.000.

Sommer, Gerhard B., to Republic Industries, Inc. Door stop for use with automatic door operators. 4,185,512, Cl. 74-411.500.

Sony Corporation: *See—*
Marita, Kouji; and Mogi, Takao, 4,186,345, Cl. 325-37.000.
Mukaida, Kumio, 4,185,794, Cl. 242-201.000.
Numakura, Toshihiko, 4,186,411, Cl. 358-8.000.

Sorema S.r.l.: *See—*
Gazzoni, Domenico, 4,185,925, Cl. 366-69.000.

Souzu, Isao: *See—*
Kubo, Kazuo; Ito, Noriki; Souzu, Isao; Isomura, Yasuo; Homma, Hiroshige; and Murakami, Masuo, 4,186,200, Cl. 424-256.000.

Space Age Electronics Limited: *See—*
Toubkin, Walter M.; and Mulley, Alan J., 4,186,371, Cl. 367-109.000.

Spann, Donald C. Surgical body positioner. 4,185,813, Cl. 269-328.000.

Spatz, Sydney M.; Hydell, Robert C.; and Davis, Gerald T., to Mead Corporation, The. Novel radiation curable coating compositions for pressure-sensitive transfer sheets. 4,186,115, Cl. 260-22.00R.

Spencer, Bette M.: *See*—
Light, Kenneth K.; Spencer, Bette M.; Vinals, Joaquin F.; Kiwala, Jacob; Vock, Manfred H.; and Shuster, Edward J., 4,186,149, Cl. 260-586.00R.

Spencer Wright Industries, Inc.: *See*—
Bardsley, Harold B.; and Priestley, Harry, 4,185,568, Cl. 112-79.00R.
Inman, Billy E., 4,185,569, Cl. 112-79.00R.

Speranza, George P.: *See*—
Klein, Howard P.; and Speranza, George P., 4,186,255, Cl. 521-128.000.

Sperry Corporation: *See*—
McMahon, Donald H., 4,185,884, Cl. 350-96.140.

Spies, Klaus. Method and system for supporting a roof. 4,185,940, Cl. 405-288.000.

Spinner, Irving H.: *See*—
Hunter, Robert F.; and Spinner, Irving H., 4,186,174, Cl. 423-54.000.

SpinOptic, Inc.: *See*—
Alsina, Pierre A., 4,185,917, Cl. 356-155.000.

Spivack, Mark A., to Union Carbide Corporation. Plural mold process for producing non-uniform pellicles. 4,186,164, Cl. 264-81.000.

Spraying Systems Co.: *See*—
O'Brien, Edward J., 4,185,781, Cl. 239-600.000.

Sprecker, Mark A.: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,186,150, Cl. 260-586.00G.

Sprey, Raymond E., to Disogrin Industries Corporation. Elastomeric polyurethane compositions and seals. 4,186,261, Cl. 528-75.000.

SPS Technologies, Inc.: *See*—
Boys, John T., 4,185,701, Cl. 173-12.000.
Boys, John T., 4,185,701, Cl. 173-12.000.

Stackpole Components Company: *See*—
Overton, Arthur W.; and Sykora, Allan J., 4,186,288, Cl. 200-164.00R.

Staeubli Ltd.: *See*—
Heiniger, Kurt, 4,185,666, Cl. 139-82.000.

Stager, Phyllis H. Disposable cosmetic glove. 4,185,330, Cl. 2-164.000.

Stahl, Peter: *See*—
Roder, Albert; Mollering, Hans; Gruber, Wolfgang; Beaucamp, Klaus; Seidel, Hans; Stahl, Peter; and von Hoerschelmann, Detlef, 4,186,052, Cl. 435-28.000.

Stal Refrigeration AB: *See*—
Lundberg, Knut A. L., 4,185,949, Cl. 418-203.000.

Stamm, Bruno. Score display device. 4,185,583, Cl. 116-225.000.

Stana, James M.: *See*—
Taylor, Thomas N.; Mahler, Charles J.; and Stana, James M., 4,185,908, Cl. 355-3.00R.

Standard Oil: *See*—
Kvapil, Rudolph; and Clews, K. Malcolm, 4,185,871, Cl. 299-2.000.

Standard Oil Company (Indiana): *See*—
Lin, Chi-Hung; and Pansing, William F., deceased, 4,186,082, Cl. 208-310.00Z.
McGalliard, Russell L.; and Larrabee, Gary W., 4,185,978, Cl. 62-28.000.
Morello, Edwin F., 4,186,263, Cl. 528-128.000.

Stanley Works, The: *See*—
Cotton, Lawrence M., 4,185,671, Cl. 144-134.00D.

Stant Manufacturing Company, Inc.: *See*—
Moore, Phillip L.; and Evans, John H., 4,185,751, Cl. 220-203.000.

State of Rhode Island, Board of Regents for Education of the: *See*—
Sternberger, Wayne I.; and LeBlanc, Lester R., 4,186,397, Cl. 343-7.500.

Stauffer Chemical Company: *See*—
Teach, Eugene G., 4,186,130, Cl. 548-215.000.

Steck, Edgar A.; and Alving, Carl R., to United States of America, Army. Liposome carriers in chemotherapy of leishmaniasis. 4,186,183, Cl. 424-38.000.

Steele, Thomas L.: *See*—
Swisher, George W., Jr.; and Steele, Thomas L., 4,185,875, Cl. 299-39.000.

Steimann, Roland: *See*—
Nonnenmacher, Gerhard; Robeller, Walter; Veil, Karl; and Steimann, Roland, 4,185,540, Cl. 91-497.000.

Steiniger, Wolfgang: *See*—
Heitmann, Uwe; Steiniger, Wolfgang; Pfannmuller, Joachim; Lorenzen, Heinz-Christen; Koch, Franz-Peter; and Lange, Norbert, 4,185,644, Cl. 131-109.00R.

Steinmeier, Bodo: *See*—
Hars, Christoph; Schirrich, Klaus; Steinmeier, Bodo; and Tappe, Wilfried, 4,185,879, Cl. 308-20.000.

Stephens, Craig P.; and Toth, Andrew G., to Hughes Aircraft Company. Reflective mode, dynamic scattering liquid crystal display system having a Fresnel reflector for lighting. 4,185,895, Cl. 350-345.000.

Stephens, Craig P.: *See*—
Hilton, Paul G.; Robusto, Paul F.; and Stephens, Craig P., 4,185,894, Cl. 350-338.000.

Stephens, Robert K.: *See*—
Haberlin, Richard J.; and Stephens, Robert K., 4,186,005, Cl. 430-228.000.

Sterling Extruder Corporation: *See*—
Haisser, Alan S., 4,185,396, Cl. 34-57.00R.

Stern, Howard K.: *See*—
DiMatteo, Paul L.; Ross, Joseph A.; and Stern, Howard K., 4,185,918, Cl. 356-375.000.

Sternberger, Wayne I.; and LeBlanc, Lester R., to State of Rhode Island, Board of Regents for Education of the. Short range precision navigation and tracking system and method therefor. 4,186,397, Cl. 343-7.500.

Stetsenko, Nikolai V.: *See*—
Medovar, Boris I.; Artamonov, Viktor L.; Bogachenko, Alexei G.; Shtanko, Jury P.; Bondarenko, Oleg P.; Eltsov, Konstantin S.; Stetsenko, Nikolai V.; Popov, Sergei S.; Kaganovsky, Gary P.; and Korotkov, Albert N., 4,185,683, Cl. 164-252.000.

Stevens, Francis J.: *See*—
Palmer, Ansell W.; and Stevens, Francis J., 4,185,722, Cl. 192-18.00B.

Stielau, Theodor M., to Delkor Technik (Proprietary) Limited. Vacuum belt filters. 4,186,092, Cl. 210-77.000.

Still GmbH: *See*—
Kremer, Manfred, 4,186,333, Cl. 318-376.000.

Stintzi, Earl G., to Master Lock Company. Padlock body with pick resistant warded insert assemblage. 4,185,478, Cl. 70-38.00A.

Stites, David G.: *See*—
Rabindran, K. George; and Stites, David G., 4,185,900, Cl. 353-26.00R.

Stites, Francis H.: *See*—
Brefini, Gary P.; and Stites, Francis H., 4,186,351, Cl. 325-398.000.

Stockman, Richard F., to Air Preheater Company, Inc., The. Cooling tower. 4,185,687, Cl. 165-8.000.

Stoddard, Xerxes T.; Vaseen, Vasper A.; and Terry, Ruel C. Apparatus for the wet oxidation of sulphur and the capture of generated heat. 4,186,171, Cl. 422-161.000.

Stoller, Patricia S.; Hammonds, James C.; Kloepper, John O.; and Schlobohm, Arnold, to ACF Industries, Incorporated. Trailer hitch yoke positioning assembly. 4,185,564, Cl. 410-64.000.

Stoskopf, Albert H.: *See*—
Carlson, Robert C.; and Stoskopf, Albert H., 4,186,108, Cl. 252-426.000.

Strachan, Robert, to Robertshaw Controls Company. Electrical switch assembly having rotary and axially operated switches. 4,186,284, Cl. 200-1.00A.

Stratienko, Andrew. Locking device for hydraulic actuator. 4,185,539, Cl. 91-45.000.

Straubel Paper Company: *See*—
Fisk, Dwight; and Drew, Willis P., 4,185,742, Cl. 206-414.000.

Streit, Kenneth F., to Phone-Ducs, Inc. Molded plastic stake. 4,185,424, Cl. 52-103.00R.

Stricker, Alfred A.: *See*—
Buchmann, Albert H.; Cochran, Thomas J.; Ficker, Walter W.; Stricker, Alfred A.; and von Kaenel, Walter, 4,185,814, Cl. 271-108.000.

Stripling, Stephen J., to Robertshaw Controls Company. Condition responsive by-pass valve construction. 4,185,663, Cl. 137-882.000.

Stuart, Robert B. Locking device. 4,185,361, Cl. 24-73.0SG.

Stulgate, Emily M.: *See*—
Aberson, Gerhard M.; and Stulgate, Emily M., 4,186,165, Cl. 264-112.000.

Sturni, Lance C.: *See*—
Schimmel, Karl F.; Sturni, Lance C.; and Robles, Martin J., 4,186,124, Cl. 260-37.0EP.

Stuzzi Radiotechnische Fabrik Spezialunternehmen fur Magnettontechnik, Firma: *See*—
Stuzzi, Viktor, 4,185,793, Cl. 242-199.000.

Stuzzi, Viktor, to Stuzzi Radiotechnische Fabrik Spezialunternehmen fur Magnettontechnik, Firma. Cassette using tape-marking elements. 4,185,793, Cl. 242-199.000.

Suga, Nagaichi. Color displaying apparatus. 4,185,920, Cl. 356-406.000.

Sugalski, Raymond K., to General Electric Company. Hermetically sealed electrochemical storage cell. 4,186,246, Cl. 429-60.000.

Suganuma, Tsuneo: *See*—
Onoda, Seiichi; Tanaka, Toshiki P.; Suganuma, Tsuneo; Ishida, Koji; and Sumi, Masao, 4,185,890, Cl. 350-96.330.

Sugasawa, Tsutomu; Toyoda, Tatsuo; Sasakura, Kazuyuki; Ueda, Shiro; Takase, Akira; Okuno, Katsuto; Ishizuka, Ichiro; and Sumimoto, Shinzaburo, to Shionogi & Co., Ltd. Process for the production of cyanopinacolone. 4,186,144, Cl. 260-465.100.

Sugibuchi, Kazuo: *See*—
Kubota, Naohiro; Shibata, Toshihiro; and Sugibuchi, Kazuo, 4,186,151, Cl. 260-591.000.

Sugihara, Kunihiko: *See*—
Onoda, Michio; Nakajima, Yasuo; Sugihara, Kunihiko; and Nagumo, Shin-ichi, 4,185,599, Cl. 123-75.00B.

Sullivan, Maurice D., Jr., to Sullivan, Thomas E.; and Kirkpatrick, III James W., part interest to each. Speedometer tester. 4,185,489, Cl. 73-2.000.

Sullivan, Thomas E.: *See*—
Sullivan, Maurice D., Jr., 4,185,489, Cl. 73-2.000.

Sulzer Brothers Limited: *See*—
Huber, Max, 4,186,159, Cl. 261-112.000.

Sumi, Masao: *See*—
Onoda, Seiichi; Tanaka, Toshiki P.; Suganuma, Tsuneo; Ishida, Koji; and Sumi, Masao, 4,185,890, Cl. 350-96.330.

Sumimoto, Shinzaburo: *See*—
Sugasawa, Tsutomu; Toyoda, Tatsuo; Sasakura, Kazuyuki; Ueda, Shiro; Takase, Akira; Okuno, Katsuto; Ishizuka, Ichiro; and Sumimoto, Shinzaburo, 4,186,144, Cl. 260-465.100.

Sumitomo Chemical Company, Limited: *See*—
Fujimoto, Masanori; Fukami, Kosuke; Tsuji, Kozo; and Nagase, Tsuneyuki, 4,186,024, Cl. 106-162.000.
Imada, Kunihiko; Ohtake, Katsumasa; Ohshima, Taizo; and Sakaguchi, Sanae, 4,185,959, Cl. 8-26.000.
Shiga, Shujiro; Katsumata, Takeshi; Okamoto, Yasushi; and Higasa, Tadashi, 4,186,177, Cl. 423-239.000.
Sumitomo Rubber Industries, Ltd.: *See*—
Tominaga, Ichiro, 4,185,831, Cl. 273-235.00R.
Summit Mining Limited: *See*—
Pentith, Gerald R. O., 4,185,876, Cl. 299-45.000.
Suntech, Inc.: *See*—
Butte, Walter A., Jr.; and Murtaugh, William J., 4,186,146, Cl. 260-570.50P.
Superior Electric Company, The: *See*—
Singh, Gurdial, 4,186,316, Cl. 310-49.00R.
Surkov, Viktor G.: *See*—
Zabava, Jury G.; Kogan, Rem N.; Lurie, Dzhan A.; Surkov, Viktor G.; Bratslavskaya, Elvira A.; Barabash, Ivan M.; Rodnyanksy, Ilya G.; Maljukyavichjus, Antanas A.; Voitenko, Egor T.; Anisovich, Gennady A.; Bevza, Vladimir F.; Tutov, Vadim I.; Grinberg, Valentin A.; Marukovich, Evgeny I.; and Senkin, Nikolai A., 4,185,684, Cl. 164-263.000.
Sutton, Kenneth O.: *See*—
Baird, William R.; Sutton, Kenneth O.; and Baird, Billy C., 4,186,055, Cl. 202-248.000.
Sutton, William M., to FMC Corporation. Water intake screen installation and method of straining water. 4,186,091, Cl. 210-77.000.
Suzuki, Fujio: *See*—
Kasuga, Masao; Takahashi, Nobuaki; Suzuki, Fujio; and Iwasaki, Yoshiki, 4,186,281, Cl. 179-100.4ST.
Suzuki, Suzuo: *See*—
Nagaishi, Hatsuo; Suzuki, Suzuo; and Matsubara, Yuji, 4,185,604, Cl. 123-119.00A.
Suzuki, Yoshihisa: *See*—
Miyazaki, Tsutomu; and Suzuki, Yoshihisa, 4,185,761, Cl. 226-181.000.
Svedia Dental-Industri Aktiebolag: *See*—
Nordin, Elling H.; and Sjoman, Karl O., 4,185,386, Cl. 433-82.000.
Svensson, Stig: *See*—
Bergstrom, Rolf; and Svensson, Stig, 4,185,454, Cl. 59-1.000.
Swanson, Larry D., to Deere & Company. Switch and throttle lever combination for use in conjunction with snowmobile engine speed limiting system. 4,186,291, Cl. 200-61.860.
Swemac S.A.: *See*—
Hellberg, Enar V., 4,186,094, Cl. 210-221.00P.
Swenson, Oscar J. Foot and leg exerciser. 4,185,622, Cl. 128-25.00B.
Swisher, George W., Jr.; and Steele, Thomas L., to CMI Corporation. Asphalt crushing apparatus. 4,185,875, Cl. 299-39.000.
Swiss Aluminium Ltd.: *See*—
Akeret, Rudolf, 4,186,034, Cl. 148-2.000.
Eichenberger, Walter; and Hilge, Bernhard, 4,185,810, Cl. 266-259.000.
Swithenbank, Colin: *See*—
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,185,995, Cl. 71-124.000.
Sykora, Allan J.: *See*—
Overton, Arthur W.; and Sykora, Allan J., 4,186,288, Cl. 200-164.00R.
Sykora, John M.; and Pollack, Theodore W., to Field Container Corporation, by said John M. Sykora; and Mogen David Wine Corporation, by said Theodore W. Pollack. Ornamental package structure. 4,185,767, Cl. 229-39.00R.
Systems Concept, Inc.: *See*—
Gutierrez, Enrique H., 4,185,423, Cl. 52-79.900.
Szmuszkovicz, Jacob: *See*—
Kane, Michael P.; and Szmuszkovicz, Jacob, 4,186,208, Cl. 424-324.000.
Tachihara, Satoru: *See*—
Ogawa, Ryota; Okudaira, Sadao; Itoh, Takayuki; and Tachihara, Satoru, 4,185,893, Cl. 350-184.000.
Tachiki, Shigeo: *See*—
Okada, Yasunori; Osada, Yuichi; Nakano, Mineo; Kasai, Shozo; Tachiki, Shigeo; Hayashi, Nobuyuki; and Abo, Masahiro, 4,186,122, Cl. 260-31.40R.
Takada, Juichiro, to Takata Kojyo Co., Ltd. Device for preventing a belt from being pulled from a retractor. 4,185,791, Cl. 242-107.200.
Takagi, Hitoshi: *See*—
Kitamura, Taketsugu; and Takagi, Hitoshi, 4,186,176, Cl. 423-235.000.
Takahashi, Nobuaki: *See*—
Kasuga, Masao; Takahashi, Nobuaki; Suzuki, Fujio; and Iwasaki, Yoshiki, 4,186,281, Cl. 179-100.4ST.
Takahashi, Shoichiro, to Kenlock Corporation. Locking device in a telescopic tripod leg assembly. 4,185,936, Cl. 403-104.000.
Takahira, Takashi: *See*—
Nitta, Sukekazu; Watanabe, Takuji; and Takahira, Takashi, 4,185,972, Cl. 55-155.000.
Takase, Akira: *See*—
Sugasawa, Tsutomu; Toyoda, Tatsuo; Sasakura, Kazuyuki; Ueda, Shiro; Takase, Akira; Okuno, Katsuto; Ishizuka, Ichiro; and Sumimoto, Shinzaburo, 4,186,144, Cl. 260-465.100.
Takata Kojyo Co., Ltd.: *See*—
Takada, Juichiro, 4,185,791, Cl. 242-107.200.
Takayama, Kazuo, to Fujitsu Ten Limited. Antenna tuning circuit. 4,186,350, Cl. 325-383.000.
Takayama, Shoichiro, to Oki Electric Industry Co., Ltd. Facsimile compression system. 4,186,415, Cl. 358-260.000.
Takeuchi, Kazuo: *See*—
Godai, Tomokazu; Takeuchi, Yasuhito; Nakai, Kozo; Takeuchi, Kazuo; and Morioka, Yoshihisa, 4,185,921, Cl. 356-426.000.
Takeuchi, Yasuhito: *See*—
Godai, Tomokazu; Takeuchi, Yasuhito; Nakai, Kozo; Takeuchi, Kazuo; and Morioka, Yoshihisa, 4,185,921, Cl. 356-426.000.
Tamai, Yasuo: *See*—
Ogawa, Hiroshi; Nakamura, Matsuaki; and Tamai, Yasuo, 4,186,228, Cl. 428-413.000.
Tamietto, Teresio, to Istituto Biologico Chemioterapico "ABC" S.p.A. Process for the preparation of an indole-3-acetohydroxamic acid. 4,186,133, Cl. 260-326.13R.
Tanahashi, Toshio; and Fujioka, Yasuo, to Toyota Jibosha Kogyo Kabushiki Kaisha. Exhaust double pipe of an internal combustion engine. 4,185,463, Cl. 60-322.000.
Tanaka, Eiichi; Nohara, Norimasa; Tomitani, Takehiro; Kakegawa, Makoto; and Kumano, Nobuo, to Tokyo Shibaura Electric Co., Ltd. Radiation measuring apparatus employing variable rate pulse sampling control. 4,186,307, Cl. 250-363.00S.
Tanaka, Hideo: *See*—
Torii, Sigeru; Kobayashi, Yuichi; and Tanaka, Hideo, 4,186,141, Cl. 260-345.90R.
Tanaka, Keihachiro: *See*—
Ohsato, Nobuyoshi; Tanaka, Keihachiro; and Mizushima, Eiji, 4,185,981, Cl. 65-5.000.
Tanaka, Toshiki P.: *See*—
Onoda, Seiichi; Tanaka, Toshiki P.; Suganuma, Tsuneo; Ishida, Koji; and Sumi, Masao, 4,185,890, Cl. 350-96.330.
Tanaka, Yoshito, to Toko Kabushiki Kaisha. Multiple pushbutton switch assembly. 4,186,285, Cl. 200-5.00E.
Tanaka, Yukiyasu: *See*—
Noguchi, Masaaki; Tanaka, Yukiyasu; and Igarashi, Isao, 4,185,596, Cl. 123-51.00B.
Tanoue, Takakiyo; and Itakura, Noriyuki, to Mitsubishi Jukogyo Kabushiki Kaisha. Shoe for crawler belt. 4,185,877, Cl. 305-35.00R.
Taoka, Tadami; Nakajima, Fumio; Kawamura, Hisashki; Hirano, Yutaka; Maru, Kimio; Arita, Kazutoshi; and Yoshida, Hidemasa, to Union Kogaku Kabushiki Kaisha. High-temperature microscope. 4,186,305, Cl. 250-311.000.
Tappe, Wilfried: *See*—
Hars, Christoph; Schirrich, Klaus; Steinmeier, Bodo; and Tappe, Wilfried, 4,185,879, Cl. 308-20.000.
Tarbutton, Peter N., to Miles Laboratories, Inc. Composition and method for determination of cholesterol. 4,186,251, Cl. 435-11.000.
Tarkinson, Edward G.: *See*—
Armstrong, John L.; and Tarkinson, Edward G., 4,186,031, Cl. 134-1.000.
Tateishi, Iwao, to Sharp Kabushiki Kaisha. Electronic tape measure with comparison capabilities. 4,185,390, Cl. 33-139.000.
Taylor, Brian P.; and Chaudry, Khalid O., to Plessey Handel und Investments AG. Disc record player. 4,185,836, Cl. 274-23.00A.
Taylor, Jerry A.: *See*—
Williams, Rodney B.; and Taylor, Jerry A., 4,185,696, Cl. 171-38.000.
Williams, Rodney B.; and Taylor, Jerry A., 4,185,713, Cl. 180-242.000.
Taylor, Thomas N.; Mahler, Charles J.; and Stana, James M., to Xerox Corporation. Vernier belt tensioning system for a photocopying machine. 4,185,908, Cl. 355-3.00R.
Taylor, William T. Releasable wireline overshot. 4,185,865, Cl. 294-86.300.
Tchack, Eli. Method for low fat cooking and conjoining cooking racks therefor. 4,186,217, Cl. 426-523.000.
Teach, Eugene G., to Stauffer Chemical Company. N-(haloalkanoyl) oxazolidines. 4,186,130, Cl. 548-215.000.
Technic, Inc.: *See*—
Morrissey, Ronald J., 4,186,064, Cl. 204-43.00G.
Technisch Handels- en Adviesbureau van Geffen B.V.: *See*—
van Geffen, Johannes A., 4,185,486, Cl. 72-71.000.
Technology Glass Corporation: *See*—
Dumesnil, Maurice E.; and Schreier, Ulrich, 4,186,023, Cl. 106-53.000.
Teichmann, Gunther: *See*—
Woditsch, Peter; Teichmann, Gunther; Linde, Gunter; Lailach, Gunter; and Rodi, Fritz, 4,186,028, Cl. 106-300.000.
Tekma Kinomat S.p.A.: *See*—
Camardella, Giuseppe, 4,185,789, Cl. 242-7.110.
Tektronix, Inc.: *See*—
White, Peter M.; and Timmins, David L., 4,186,368, Cl. 338-28.000.
Teledyne Industries, Inc.: *See*—
Gudzin, Martin G., 4,186,325, Cl. 310-331.000.
Johnson, Donald L., 4,185,882, Cl. 339-176.0MP.
Telefex Incorporated: *See*—
Webb, Grant A., 4,185,515, Cl. 74-501.00P.
Teleflex Morse Limited: *See*—
Gill, John G.; and Hemens, James F., 4,185,517, Cl. 74-512.000.
Temple, Paul A.: *See*—
Decker, Donald L.; and Temple, Paul A., 4,185,497, Cl. 73-190.0EW.
Terry, Ruel C., to In Situ Technology, Inc. Underground linkage of wells for production of coal in situ. 4,185,692, Cl. 166-257.000.
Terry, Ruel C.: *See*—
Stoddard, Xerxes T.; Vaseen, Vasper A.; and Terry, Ruel C., 4,186,171, Cl. 422-161.000.

Tesmann, Holger; Weinrich, Erwin; and Lieske, Edgar, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Guanidine accelerators for peroxide hair bleaching compositions. 4,186,186, Cl. 424-62.000.
Tester, Colin A., to Metal Box Limited. Waste disposal system. 4,185,973, Cl. 55-212.000.
Tetsuo, Susumu. Vibration ram. 4,186,197, Cl. 404-133.000.
Texaco Development Corporation: *See*—
Cuscurida, Michael; and Zimmerman, Robert L., 4,186,254, Cl. 521-115.000.
Klein, Howard P.; and Speranza, George P., 4,186,255, Cl. 521-128.000.
Texaco Inc.: *See*—
Schlicht, Raymond C.; and Cummings, William M., 4,185,965, Cl. 44-63.000.
Texas Instruments Incorporated: *See*—
Kyle, Robert R., 4,186,342, Cl. 325-17.000.
Textron Inc.: *See*—
McLarty, Daniel R., 4,185,509, Cl. 74-200.000.
Thenard, Jean: *See*—
Basire, Alain; Roche, Pierre; and Thenard, Jean, 4,186,301, Cl. 250-204.000.
Thermal Insulation Company: *See*—
Cantrell, James E., 4,185,433, Cl. 52-404.000.
Thetford Corporation: *See*—
Sargent, Frank T.; Antos, John M.; Henke, Arthur W.; Embach, James T.; Butler, Frederick A.; and Lindsay. Erin J., 4,185,337, Cl. 4-300.000.
Sargent, Frank T.; Henke, Arthur W.; Antos, John M.; and Cameron, John T., 4,185,340, Cl. 4-441.000.
Thienemann, Rolf A.: *See*—
Krum, Howard L.; and Thienemann, Rolf A., 4,185,928, Cl. 400-90.000.
Thomas, Daniel C.: *See*—
Muzyczko, Thaddeus M.; and Thomas, Daniel C., 4,186,069, Cl. 430-175.000.
Thomas, Harold A., to General Atomic Company. Neutron flux monitoring system. 4,186,048, Cl. 176-19.00J.
Thominet, Michel; Bulteau, Gerard; Acher, Jacques; and Collignon, Claude, to Societe D'Etudes Scientifiques et Industrielles de L'ile-de-France. Substituted 2,3-alkylene bis (oxy) benzamides and derivatives and method of preparation. 4,186,135, Cl. 260-326.340.
Thompson, John R., to United States of America, Navy. System for measuring in situ acoustic energy properties of ocean floor soils. 4,186,373, Cl. 367-131.000.
Thomson-CSF: *See*—
Castellani, Jean-Louis; Flayosc, Edmond; and Pasternak, Jean, 4,186,375, Cl. 360-40.000.
Delagebeaudeuf, Daniel; and Pearsall, Thomas, 4,186,407, Cl. 357-13.000.
Thorn Electrical Industries Limited: *See*—
Rees, John M.; Horler, Christopher A.; and Downing, Anthony P., 4,185,922, Cl. 316-5.000.
Thornburgh, William F., to General Motors Corporation. Dual displacement engine control. 4,185,607, Cl. 123-198.00F.
Thorwaldsen, Stanley E.: *See*—
Schmidt, William M.; Thorwaldsen, Stanley E.; McElroy, David C.; and Miggels, Stephen G., 4,185,867, Cl. 296-187.000.
Thring, Robin H.: *See*—
Rogers, Brian H.; and Thring, Robin H., 4,185,469, Cl. 62-174.000.
Thurmond, Elmer T., Jr., to Equipment Company of America. Folding noseplate for a handtruck. 4,185,853, Cl. 280-652.000.
Tidwell, Hubert. Self-steering crop irrigator. 4,185,774, Cl. 239-184.000.
Tien, Tseng Y.: *See*—
Romine, Donald J.; Davis, Donald C.; Woodruff, Phillip R.; Young, Ching T.; Bode, James D.; and Tien, Tseng Y., 4,186,071, Cl. 204-195.00S.
Tilkanen, Simo O., to Farmos-Yhtyma Oy. Method of preparing growth substrates having a predetermined particle size. 4,185,987, Cl. 71-24.000.
Tilton, Steven D. Weight responsive spray bird-scare perch. 4,185,581, Cl. 116-22.00A.
Timmerman, Daniel M.: *See*—
Florens, Raymond L.; and Timmerman, Daniel M., 4,186,010, Cl. 430-627.000.
Timmins, David L.: *See*—
White, Peter M.; and Timmins, David L., 4,186,368, Cl. 338-28.000.
Tisone, Thomas C.; and Bolker, Barry F. T., to Gould Inc. Thin film strain gage and process therefor. 4,185,496, Cl. 73-141.00A.
Titanium Industries: *See*—
Langley, Robert C., 4,186,066, Cl. 204-98.000.
TMC Corporation: *See*—
Himmetsberger, Alois; and Weigl, Erwin, 4,185,852, Cl. 280-618.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Itoh, Takuji; Sakurada, Satoshi; Okano, Shohei; Obayashi, Takashi; Toyoizumi, Takeo; and Iwata, Osami, 4,186,078, Cl. 208-27.000.
Tojo, Tetsuo: *See*—
Matsuda, Akira; Tojo, Tetsuo; and Iwata, Kazuo, 4,186,240, Cl. 428-349.000.
Toko Kabushiki Kaisha: *See*—
Tanaka, Yoshito, 4,186,285, Cl. 200-5.00E.
Tokumaru, Akira: *See*—
Nakazato, Motoyasu; Tokumaru, Akira; Kobayashi, Toshitaka; and Kamishima, Akio, 4,185,547, Cl. 99-453.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Hirata, Akio, 4,186,334, Cl. 318-805.000.
Tokyo Shibaura Electric Co., Ltd.: *See*—
Arimura, Yoshiaki, 4,186,412, Cl. 358-101.000.
Nomura, Yutaka; and Koyama, Mitsuaki, 4,185,910, Cl. 355-15.000.
Tanaka, Eiichi; Nohara, Norimasa; Tomitani, Takehiro; Kakegawa, Makoto; and Kumano, Nobuo, 4,186,307, Cl. 250-363.00S.
Tomaja, David L., to Phillips Petroleum Company. Crown ether uranyl halide complexes. 4,186,175, Cl. 204-158.00R.
Tominaga, Ichiro, to Sumitomo Rubber Industries, Ltd. Composition for the outer layer of a golf ball. 4,185,831, Cl. 273-235.00R.
Tomitani, Takehiro: *See*—
Tanaka, Eiichi; Nohara, Norimasa; Tomitani, Takehiro; Kakegawa, Makoto; and Kumano, Nobuo, 4,186,307, Cl. 250-363.00S.
Tommasi, Giulio: *See*—
Di Gioacchino, Alberto; Tommasi, Giulio; and de Manuele, Mario, 4,186,180, Cl. 423-469.000.
Tommasi, Ivano: *See*—
Cocca, Vincenzo; Tommasi, Ivano; and Cau, Pasqualino, 4,186,232, Cl. 428-177.000.
Tomy Kogyo Co., Inc.: *See*—
Akiyama, Kenzo; and Ogihara, Masaru, 4,185,533, Cl. 84-83.000.
Tongret, Stewart: *See*—
Tubin, E. Sam; and Tongret, Stewart, 4,185,691, Cl. 166-250.000.
Toray Industries, Inc.: *See*—
Katsuki, Kosuke; and Watanabe, Shizuo, 4,186,179, Cl. 423-447.400.
Torii, Sigeru; Kobayashi, Yuichi; and Tanaka, Hideo, to Otsuka Kagaku Yakuhin Kabushiki Kaisha. Process for preparing 2-pentynyl ether. 4,186,141, Cl. 260-345.90R.
Toth, Andrew G.: *See*—
Stephens, Craig P.; and Toth, Andrew G., 4,185,895, Cl. 350-345.000.
Toth, Theodore S.: *See*—
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.
Totino, Peter J.; and Sedlatschek, Robert, to Singer Company, The. Track guided needle threader system. 4,185,574, Cl. 112-225.000.
Toubkin, Walter M.; and Mulley, Alan J., to Space Age Electronics Limited. Echo sounders. 4,186,371, Cl. 367-109.000.
Townley, Kenneth G.: *See*—
Bonsall, Peter C.; Morrison, James W.; Nicholson, Eric S.; Smith, George B.; and Townley, Kenneth G., 4,186,105, Cl. 252-400.00R.
Toyoda Machine Works, Ltd.: *See*—
Nakaso, Tohru; Hosokawa, Manabu; Nomura, Kenzi; and Hikosaka, Tatsuya, 4,185,377, Cl. 29-568.000.
Toyoda, Tatsuo: *See*—
Sugasawa, Tsutomu; Toyoda, Tatsuo; Sasakura, Kazuyuki; Ueda, Shiro; Takase, Akira; Okuno, Katsuto; Ishizuka, Ichiro; and Sumimoto, Shinzaburo, 4,186,144, Cl. 260-465.100.
Toyoizumi, Takeo: *See*—
Itoh, Takuji; Sakurada, Satoshi; Okano, Shohei; Obayashi, Takashi; Toyoizumi, Takeo; and Iwata, Osami, 4,186,078, Cl. 208-27.000.
Toyota Jibosha Kogyo Kabushiki Kaisha: *See*—
Tanahashi, Toshio; and Fujioka, Yasuo, 4,185,463, Cl. 60-322.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Noguchi, Masaaki; Tanaka, Yukiyasu; and Igarashi, Isao, 4,185,596, Cl. 123-51.00B.
Onishi, Shigeru, 4,185,598, Cl. 123-73.00A.
Shiomi, Masanao; and Miyoshi, Shigetoshi, 4,185,880, Cl. 308-189.00R.
Tracy, Charles H. Back-lighted signboard. 4,185,408, Cl. 40-564.000.
Traficante, Michael G. Position matching board game apparatus. 4,185,832, Cl. 273-237.000.
Tranberg, Erik R.; and Widen, Bo G., to Gkn-Stenman AB. Lock follower, particularly a cylinder follower, and a method of manufacturing the same. 4,185,481, Cl. 70-379.00R.
Treiman, Alfred A. Garment hanger having latch to prevent swiveling. 4,185,768, Cl. 223-85.000.
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Burroughs, Wise; and Trenkle, Allen H., 4,186,213, Cl. 426-2.000.
Tresper, Erhard: *See*—
Binsack, Rudolf; Reese, Eckart; Tresper, Erhard; and Wank, Joachim, 4,186,154, Cl. 525-461.000.
Triad, Inc.: *See*—
Morrow, Richard B. A., 4,185,621, Cl. 128-672.000.
Trico Equipment Corporation: *See*—
Fish, Ronald W., 4,185,350, Cl. 15-236.00C.
Troitsky, Rostislav A.: *See*—
Prozorov, Vladimir N.; Malyshev, Boris N.; Ognev, Boris V.; Troitsky, Rostislav A.; and Polonsky, Alexandr K., 4,185,633, Cl. 128-303.100.
Troost, Robert C., to Pennwalt Corporation. Balanced torsional deflection of flexible shafts in either direction of rotation. 4,185,473, Cl. 64-2.00R.
Troupe, Emily Jean: *See*—
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.
TRW Inc.: *See*—
Woods, Thomas H.; and Aultz, Thomas R., 4,185,646, Cl. 133-4.00R.
Trygstad, Olav E.: *See*—
Reichelt, Karl-Ludwig; and Trygstad, Olav E., 4,186,198, Cl. 424-177.000.
Tseng, Ching Y.: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.;

Tseng, Ching Y.; and Sprecker, Mark A., 4,186,150, Cl. 260-586.00G.
Tsou, Ivan H., to Grow Chemical Corp. Cathodic electrodeposition coating compositions containing diels-alder adducts. 4,186,117, Cl. 260-23.0AR.
Tsuchiya, Shuji: *See—*
Murata, Atsuo; Tsuchiya, Shuji; Konno, Akihiro; and Uchida, Jun, 4,186,148, Cl. 260-583.00H.
Tsuji, Kozo: *See—*
Fujimoto, Masanori; Fukami, Kosuke; Tsuji, Kozo; and Nagase, Tsuneyuki, 4,186,024, Cl. 106-162.000.
Tsukumo, Zenzaburo, to Tsukumo, Zenzaburo; and NTN Toyo Bearing Company, Limited. Guiding device for endless apron. 4,185,738, Cl. 198-814.000.
Tubin, E. Sam; and Tongret, Stewart, to Tubin, E. Sam. Secondary oil recovery method and system. 4,185,691, Cl. 166-250.000.
Tucker, Albert R.: *See—*
Milberger, Lionel J.; and Tucker, Albert R., 4,185,541, Cl. 91-526.000.
Tutov, Vadim I.: *See—*
Zabava, Jury G.; Kogan, Rem N.; Lurie, Dzhan A.; Surkov, Viktor G.; Bratslavskaya, Elvira A.; Barabash, Ivan M.; Rodnyanksy, Ilya G.; Maljukyavichjus, Antanas A.; Voitenko, Egor T.; Anisovich, Gennady A.; Bevza, Vladimir F.; Tutov, Vadim I.; Grinberg, Valentin A.; Marukovich, Evgeny I.; and Senkin, Nikolai A., 4,185,684, Cl. 164-263.000.
Twitchett, Stephen R., to Kigass Engineering Ltd. Anti-static device. 4,186,421, Cl. 361-212.000.
TX RX Systems Inc.: *See—*
Kaegebein, Daniel P., 4,186,359, Cl. 333-134.000.
Tykulsky, Alexander: *See—*
Minior, Thaddeus G.; and Tykulsky, Alexander, 4,185,641, Cl. 128-675.000.
Uchida, Hisao, to Nissan Motor Company, Limited; and Kanto Seiki Company, Limited. Illuminable safety and vehicle function display device. 4,186,376, Cl. 340-52.00F.
Uchida, Jun: *See—*
Murata, Atsuo; Tsuchiya, Shuji; Konno, Akihiro; and Uchida, Jun, 4,186,148, Cl. 260-583.00H.
Uchida, Keiichi: *See—*
Yamazaki, Akihiro; Morisawa, Hirokazu; Oda, Yoshio; and Uchida, Keiichi, 4,186,266, Cl. 544-313.000.
Ueda, Shiro: *See—*
Sugasawa, Tsutomu; Toyoda, Tatsuo; Sasakura, Kazuyuki; Ueda, Shiro; Takase, Akira; Okuno, Katsuto; Ishizuka, Ichiro; and Sumimoto, Shinzaburo, 4,186,144, Cl. 260-465.100.
Ueng, Ming-Shean. Circular butterfly. 4,185,826, Cl. 273-106.00B.
Uffer, Michael B.: *See—*
Cullis, Herbert M.; DeVries, James H.; Lohr, David A.; Rodriquez, Rodolfo R.; and Uffer, Michael B., 4,185,629, Cl. 128-214.00R.
Ufford, David E.: *See—*
Wilkes, Robert D.; Smith, Eugene C.; and Ufford, David E., 4,185,655, Cl. 137-315.000.
Ugelstad, John, to SINTEF (Selskapet for industriell og teknisk forskning ved NTH). Process for producing finely divided aqueous emulsions from materials of limited water solubility. 4,186,120, Cl. 260-29.6RB.
Ulbrich, Gerhard, to Robert Bosch GmbH. Wiping arrangement for wiping a vehicle window, and a method of manufacturing the same. 4,185,353, Cl. 15-250.360.
Ulff, Carl B. J.: *See—*
Carlsson, Per A. E.; Carnmalm, Bernt S. E.; Ross, Vante B.; and Ulff, Carl B. J., 4,186,202, Cl. 424-263.000.
Ulmschneider, Lawrence A.; and Dowling, Edward H., to Eastman Kodak Company. Method of continuous injection molding of plastic articles. 4,186,161, Cl. 264-37.000.
Umeda, Ikuo; Aiba, Masahiko; and Kimura, Kozo, to Sharp Kabushiki Kaisha. Print position control in a printer including a printer head mounted on a traveling carriage. 4,185,930, Cl. 400-320.000.
Umezawa, Kazumi: *See—*
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,185,909, Cl. 355-15.000.
Umezu, Yutaka: *See—*
Sakashita, Kazumi; Hiratsuka, Kenji; Umezu, Yutaka; Nakamura, Nobuo; and Noda, Haruhisa, 4,186,234, Cl. 428-283.000.
Uni-Cardan Aktiengesellschaft: *See—*
Krude, Werner, 4,185,476, Cl. 64-21.000.
Union Carbide Corporation: *See—*
Hall, Wilbur S., 4,186,219, Cl. 427-8.000.
Kiyonaga, Kazuo, 4,185,984, Cl. 65-135.000.
Mellors, Geoffrey W., 4,186,248, Cl. 429-191.000.
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Seese, Robert G.; Fitzgibbon, Alan; and Slish, Frank, 4,185,999, Cl. 75-148.000.
Smith, Timothy J. C., 4,186,226, Cl. 427-340.000.
Spivack, Mark A., 4,186,164, Cl. 264-81.000.
Union Kogaku Kabushiki Kaisha: *See—*
Taoka, Tadami; Nakajima, Fumio; Kawamura, Hisashki; Hirano, Yutaka; Maru, Kimio; Arita, Kazutoshi; and Yoshida, Hidemasa, 4,186,305, Cl. 250-311.000.
Union Oil Company of California: *See—*
Fleck, Raymond N., 4,186,059, Cl. 203-14.000.
Mickelson, Grant A., 4,186,081, Cl. 208-216.00R.
Union Siderurgique du Nord et de l'Est de la France, "USINOR": *See—*
Germain, Alfred M. J., 4,185,648, Cl. 134-122.00R.
Germain, Alfred M. J., 4,185,649, Cl. 134-122.00R.
Union Special Corporation G.m.b.H.: *See—*
Kleinschmidt, Johann O.; and Schwaab, Konstantin, 4,185,570, Cl. 112-121.260.
United States of America
Air Force: *See—*
Ernst, Richard C., 4,185,458, Cl. 60-261.000.
Peash, Douglas E., 4,185,858, Cl. 285-367.000.
Quinville, James A., 4,185,558, Cl. 102-105.000.
Wilkinson, David B., 4,185,461, Cl. 60-261.000.
Williamson, Tommy L.; and Rose, Harold W., 4,185,919, Cl. 356-141.000.
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Aron, Gunter; and Hassis, Carl H., 4,186,040, Cl. 149-19.400.
Cowett, Philip M., Jr., 4,186,434, Cl. 363-24.000.
DeLai, A. Joseph; and Gazzara, Charles P., 4,186,046, Cl. 156-605.000.
Riley, Leon H., 4,185,796, Cl. 244-3.120.
Steck, Edgar A.; and Alving, Carl R., 4,186,183, Cl. 424-38.000.
Environmental Protection Agency: *See—*
Bazan, John A., 4,185,942, Cl. 406-85.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Brockman, Milton H.; and Easterling, Mahlon F. Radio frequency arraying method for receivers. 4,186,347, Cl. 325-305.000.
Feinstein, Samuel P. Viscosity measuring instrument. 4,185,493, Cl. 73-56.000.
Navy: *See—*
Anderson, Richard K.; and Rohrman, Frederick A., 4,185,554, Cl. 102-18.0MS.
Barakauskas, Edward J., 4,185,538, Cl. 89-1.810.
Decker, Donald L.; and Temple, Paul A., 4,185,497, Cl. 73-190.0EW.
Drimmer, Bernard E.; and Moffett, Everett L., 4,185,551, Cl. 102-15.000.
Gerrish, Howard W., Jr., 4,185,557, Cl. 102-103.000.
Gregory, John B., 4,186,190, Cl. 424-78.000.
Houser, Wesley G., 4,185,553, Cl. 102-18.00R.
Keithley, Joseph F.; and Sands, Matthew L., 4,185,556, Cl. 102-18.00M.
Krum, Howard L.; and Thienemann, Rolf A., 4,185,928, Cl. 400-90.000.
Little, William R., 4,185,559, Cl. 102-211.000.
Miller, Leo C.; Perschy, James A.; and Smith, Gordon D., Jr., 4,186,440, Cl. 364-900.000.
Mounce, Whitman D.; and Mann, Ralph W., 4,185,552, Cl. 102-18.00M.
Phillips, Lawrence M.; and Morinaga, Marc A., 4,185,864, Cl. 294-83.00R.
Reber, Rufus K., 4,185,578, Cl. 114-245.000.
Thompson, John R., 4,186,373, Cl. 367-131.000.
Waclawik, Francis J.; Muzaca, James P.; Cook, Robert A.; Hardin, William A.; Silvia, Alfred D.; and Correia, Ronald, 4,185,345, Cl. 9-8.00R.
Wilson, Louis; and Estes, Nelson N., 4,185,555, Cl. 102-18.00R.
U.S. Philips Corporation: *See—*
Walraven, Anthonie, 4,185,795, Cl. 242-209.000.
United States Steel Corporation: *See—*
Brayton, William E.; Fun, Fay; Hendrickson, Luther G.; and Shoenberger, Ronald W., 4,186,054, Cl. 201-6.000.
Reisdorf, Bartholomew G., 4,185,998, Cl. 75-124.000.
United Technologies Corporation: *See—*
Jalan, Vinod M.; and Landsman, Douglas A., 4,186,110, Cl. 252-447.000.
Parker, Sidney D.; Carroll, Robert G.; and Howell, William L., 4,185,457, Cl. 60-204.000.
Universal Development Company Limited: *See—*
Black, Alister, 4,186,169, Cl. 264-228.000.
University of Adelaide, The: *See—*
Ridgway, Ian G., 4,185,642, Cl. 130-27.00R.
University of Minnesota, The Regents of the: *See—*
Gassman, Paul G.; and Cue, Berkeley W., 4,186,132, Cl. 260-325.00R.
Unrod, Vladimir I.: *See—*
Ordanian, Sergei S.; Lysanov, Vladislav S.; Digonsky, Viktor V.; Blinkov, Vadim A.; Pekelis, Ljubov A.; Denisova, Vera I.; Unrod, Vladimir I.; Sinelnikov, Sergei V.; and Chestnokova, Marina P., 4,186,022, Cl. 106-43.000.
Unwin, Geoffrey: *See—*
Jones, Graham; and Unwin, Geoffrey, 4,185,626, Cl. 128-156.000.
Upjohn Company, The: *See—*
Hall, Charles M.; and Wright, John B., 4,186,127, Cl. 260-239.00B.
Kane, Michael P.; and Szmuszkovicz, Jacob, 4,186,208, Cl. 424-324.000.
Uztech, Raymond E., to Karma Division of Brandt, Inc. Mixer for reconstituting dehydrated mashed potatoes. 4,185,927, Cl. 366-131.000.
Vache, Marcel; and Ferra, Antoine, to Application Des Gaz. Container for portable stove. 4,185,748, Cl. 220-8.000.
Valek, John: *See—*
Miller, Roland E.; Scaletta, Joseph A.; and Valek, John, 4,185,488, Cl. 72-350.000.

Vallee, Louis L. Metal shingle roof traditional design. 4,185,436, Cl. 52-518.000.

Vandenboosche, Jean-Jacques: *See—*
Bugaut, Andree; Grollier, Jean-Francois; and Vandenboosche, Jean-Jacques, 4,185,958, Cl. 8-10.100.

van der Lely, Ary; and Kuipers, Arie, to C. van der Lely N. V. Overload couplings. 4,185,477, Cl. 64-28.00R.

van der Lely, Cornelis. Mowing machine. 4,185,445, Cl. 56-6.000.

Van Drie, Gerhardt. Apparatus for collecting solid and loose-waste materials. 4,185,731, Cl. 198-304.000.

van Geffen, Johannes A., to Technisch Handels- en Adviesbureau van Geffen B.V. Rotatable piercing tools for forming bossed holes. 4,185,486, Cl. 72-71.000.

Van Hise, Albert E., to Otis Elevator Company. Accurate, fail-safe relay timer. 4,186,420, Cl. 361-194.000.

van Oosten, Jacob, to B.V. Machinefabriek v/h Pannevis & Zh. Method and device for removing a liquid from a mixture of liquid and solid substances. 4,186,090, Cl. 210-77.000.

Varian Associates, Inc.: *See—*
Iwao, Kumiry R., 4,186,295, Cl. 219-497.000.

Vartia, Matti, to Printal Oy. Can body for an aerosol container. 4,185,749, Cl. 220-72.000.

Vaseen, Vasper A.: *See—*
Stoddard, Xerxes T.; Vaseen, Vasper A.; and Terry, Ruel C., 4,186,171, Cl. 422-161.000.

Vax Appliances Limited: *See—*
Brazier, Alan J., 4,185,354, Cl. 15-321.000.

Veeder, George T., III: *See—*
Kang, Kenneth S.; Veeder, George T., III; and Richey, Danny D., 4,186,025, Cl. 106-162.000.

Veeder Industries Inc.: *See—*
Fleischer, Donald W.; and Peruggi, Richard E., 4,186,381, Cl. 340-152.00R.

Vega, Mary-Louise: *See—*
Gingras, Joel A., Sr.; Heffernan, William R.; Vega, Mary-Louise; and Beachem, Michael T., 4,186,426, Cl. 362-34.000.

Veil, Karl: *See—*
Nonnenmacher, Gerhard; Robeller, Walter; Veil, Karl; and Steimann, Roland, 4,185,540, Cl. 91-497.000.

Ventre, Edmond: *See—*
Blum, Jacques M.; and Ventre, Edmond, 4,186,049, Cl. 176-38.000.

Verdicchio, Robert J.; and Rodon, Maria C., to Johnson & Johnson. Low irritating detergent compositions. 4,186,113, Cl. 252-526.000.

Vereinigte Flugtechnische Werke-Fokker GmbH: *See—*
Propp, Horst-Joachim, 4,186,237, Cl. 428-323.000.

Vergottini, Roberto A.: *See—*
Ziegler, Peter; Attwell, Michael C.; Massiah, Thomas F.; and Vergottini, Roberto A., 4,186,143, Cl. 260-397.100.

Victor Company of Japan, Ltd.: *See—*
Kasuga, Masao; Takahashi, Nobuaki; Suzuki, Fujio; and Iwasaki, Yoshiki, 4,186,281, Cl. 179-100.4ST.

Vinals, Joaquin: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,186,150, Cl. 260-586.00G.

Vinals, Joaquin F.: *See—*
Hall, John B.; Hruza, Denis E., Sr.; Shuster, Edward J.; Vock, Manfred H.; and Vinals, Joaquin F., 4,186,103, Cl. 252-174.110.
Light, Kenneth K.; Spencer, Bette M.; Vinals, Joaquin F.; Kiwala, Jacob; Vock, Manfred H.; and Shuster, Edward J., 4,186,149, Cl. 260-586.00R.

Vincent, Joe W.: *See—*
Baker, William, III; and Vincent, Joe W., 4,185,706, Cl. 175-340.000.

Vinzens, Kurt: *See—*
Buscher, Enno; and Vinzens, Kurt, 4,186,051, Cl. 176-65.000.

Vit, Rudy; and Fridrich, Igor, to Reed Ltd. Integrated tree processing mill. 4,185,672, Cl. 144-312.000.

Vock, Manfred H.: *See—*
Hall, John B.; Hruza, Denis E., Sr.; Shuster, Edward J.; Vock, Manfred H.; and Vinals, Joaquin F., 4,186,103, Cl. 252-174.110.
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Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,186,150, Cl. 260-586.00G.

Voest-Alpine Aktiengesellschaft: *See—*
Riegler, Ernst; and Schmidt, Manfred, 4,185,499, Cl. 73-229.000.

Vogt, Charles C.; and Weller, Royal. Minesweep obstructor with cable dispensing means. 4,185,550, Cl. 102-13.000.

Vogt, Wilhelm; Koch, Jurgen; and Glaser, Hermann, to Hoechst Aktiengesellschaft. Catalyst for reducing carbon monoxide with hydrogen. 4,186,112, Cl. 252-471.000.

Voitenko, Egor T.: *See—*
Zabava, Jury G.; Kogan, Rem N.; Lurie, Dzhan A.; Surkov, Viktor G.; Bratslavskaya, Elvira A.; Barabash, Ivan M.; Rodnyanksy, Ilya G.; Maljukyavichjus, Antanas A.; Voitenko, Egor T.; Anisovich, Gennady A.; Bevza, Vladimir F.; Tutov, Vadim I.; Grinberg, Valentin A.; Marukovich, Evgeny I.; and Senkin, Nikolai A., 4,185,684, Cl. 164-263.000.

Volent, Ivan; and Fermaglich, Saul. Method of producing multiple image formats. 4,185,915, Cl. 355-77.000.

Volk, Richard G.; and Muellner, Frank J., to K-D Manufacturing Company. Analyzer for transistor ignition system. 4,186,337, Cl. 324-380.000.

Volkov, Mstislav V.; and Oganesian, Oganes V. Apparatus for restoration of hip joint mobility. 4,185,623, Cl. 128-69.000.

von Bezard, Denis: *See—*
Pino, Piero; and von Bezard, Denis, 4,186,140, Cl. 260-346.740.

von Bonin, Wulf: *See—*
Bergthaller, Peter; von Bonin, Wulf; Helling, Gunter; and Marx, Paul, 4,186,014, Cl. 430-213.000.

von Hoerschelmann, Detlef: *See—*
Roder, Albert; Mollering, Hans; Gruber, Wolfgang; Beaucamp, Klaus; Seidel, Hans; Stahl, Peter; and von Hoerschelmann, Detlef, 4,186,052, Cl. 435-28.000.

von Kaenel, Walter: *See—*
Buchmann, Albert H.; Cochran, Thomas J.; Ficker, Walter W.; Stricker, Alfred A.; and von Kaenel, Walter, 4,185,814, Cl. 271-108.000.

von Langsdorff, Fritz: *See—*
Barth, Gunter; and von Langsdorff, Fritz, 4,185,939, Cl. 404-38.000.

Vsesojuzny Nauchno-Issledovatelsky Institut Abrazivov I Shlifovania: *See—*
Ordanian, Sergei S.; Lysanov, Vladislav S.; Digonsky, Viktor V.; Blinkov, Vadim A.; Pekelis, Ljubov A.; Denisova, Vera I.; Unrod, Vladimir I.; Sinelnikov, Sergei V.; and Chestnokova, Marina P., 4,186,022, Cl. 106-43.000.

Vysoka skola chemicko-technologicka: *See—*
Silhankova, Ludmila, 4,186,252, Cl. 435-120.000.

Wachtel, Helmut: *See—*
Huth, Andreas; Schmiechen, Ralph; Kehr, Wolfgang; Paschelke, Gert; Wachtel, Helmut; Schneider, Herbert H.; and Palenschat, Dieter, 4,186,129, Cl. 548-186.000.

Wachtel, Joseph, to A. B. Dick Company. Fluorescent ink for automatic identification. 4,186,020, Cl. 106-22.000.

Wacker-Chemie GmbH: *See—*
Pirson, Ewald; and Schmidlkofer, Jakob, 4,186,104, Cl. 252-358.000.

Waclawik, Francis J.; Muzaca, James P.; Cook, Robert A.; Hardin, William A.; Silvia, Alfred D.; and Correia, Ronald, to United States of America, Navy. Neg'ator spring powered underwater launching device. 4,185,345, Cl. 9-8.00R.

Wada, Mitsuyoshi; Hashimoto, Masami; and Nakahara, Teruo, to Kabushiki Kaisha Komatsu Seisakusho. Apparatus for actuating operating valve unit for winch. 4,185,662, Cl. 137-636.000.

Wagner, Kalus P., to Hercules Incorporated. Solid catalyst component for olefin polymerization. 4,186,107, Cl. 252-429.00B.

Wagner, Kuno: *See—*
Blahak, Johannes; Gipp, Roland; Wagner, Kuno; Muller, Erwin; Mazanek, Jan; and Haas, Peter, 4,186,257, Cl. 521-159.000.

Walin, Gosta. Oil collecting apparatus. 4,186,095, Cl. 210-242.00S.

Walraven, Anthonie, to U.S. Philips Corporation. Magnetic tape drive with friction compensation. 4,185,795, Cl. 242-209.000.

Walter, Thomas J., to Ethyl Corporation. Process for preparing aniline compounds. 4,186,147, Cl. 260-578.000.

Wang, Samuel S.; Smith, Eugene L., Jr.; and Huliganga, Ernie F., to American Cyanamid Company. Process for froth flotation of non-sulfide minerals. 4,186,083, Cl. 209-166.000.

Wang, Shih-Ping, to Diagnostic Information, Inc. Panel type X-ray image intensifier tube and radiographic camera system. 4,186,302, Cl. 250-213.0VT.

Wang, Shou-I; and Hansen, Charles M., Jr., to Bendix Corporation, The. Apparatus for detecting diode failures in multiple diode rectifier bridges. 4,186,391, Cl. 340-645.000.

Wank, Joachim: *See—*
Binsack, Rudolf; Reese, Eckart; Tresper, Erhard; and Wank, Joachim, 4,186,154, Cl. 525-461.000.

Ward, Eldon L., to Dow Chemical Company, The. Weak base ion exchange resins of a polyalkylenepolyamine and polyepoxide. 4,186,086, Cl. 210-37.00R.

Warnant, Julien; and Jolly, Jean, to Roussel UCLAF. Novel process for the preparation of 3-oximes of steroids. 4,186,128, Cl. 260-239.500.

Warner, Brian H.: *See—*
Molins, Desmond W.; Warner, Brian H.; Claydon, Alan G.; and Watson, Anthony W., 4,185,941, Cl. 406-77.000.

Warner, Willis L.: *See—*
Lundblad, John L.; Warner, Willis L.; and Fernandes, Peter M., 4,186,192, Cl. 424-85.000.

Wasmuth, Edward H.: *See—*
McAleer, William J.; and Wasmuth, Edward H., 4,186,193, Cl. 424-89.000.

Watanabe, Ineko: *See—*
Egawa, Eiko, 4,185,614, Cl. 126-265.000.

Watanabe, Shizuo: *See—*
Katsuki, Kosuke; and Watanabe, Shizuo, 4,186,179, Cl. 423-447.400.

Watanabe, Takuji: *See—*
Nitta, Sukekazu; Watanabe, Takuji; and Takahira, Takashi, 4,185,972, Cl. 55-155.000.

Waterworth, Peter: *See—*
Heller, Harold G.; Waterworth, Peter; and Hurditch, Rodney J., 4,186,002, Cl. 430-1.000.

Watson, Anthony W.: *See—*
Molins, Desmond W.; Warner, Brian H.; Claydon, Alan G.; and Watson, Anthony W., 4,185,941, Cl. 406-77.000.

Watson, Christopher A.; Bearcroft, Kenneth E.; Bronzite, Michael; and Palmer, Alan G., to ITT Industries, Inc. Flowmeter. 4,185,498, Cl. 73-194.00A.
Watson, Edwin B., to Bendix Corporation, The. Fuel injector. 4,185,779, Cl. 239-533.300.
Web Printing Controls Co. Inc.,: *See*—
Gnuechtel, Herman C., 4,186,309, Cl. 250-561.000.
Webb, Grant A., to Telefex Incorporated. Motion transmitting remote control assembly. 4,185,515, Cl. 74-501.00P.
Weber, Roland. Dental articulator. 4,185,387, Cl. 32-32.000.
Webermeier, Kurt; Wissinger, Waldemar; and Rulle, Otto, to Dynamit Nobel AG. Apparatus for the extrusion of patterned sheets of thermoplastic synthetic resins. 4,185,951, Cl. 425-133.500.
Weigl, Erwin: *See*—
Himmetsberger, Alois; and Weigl, Erwin, 4,185,852, Cl. 280-618.000.
Weinberg, Alan H.; and O'Sullivan, Dermot M., to Organisation Europeenne de Recherches Spatiales. Limit cycling regulator apparatus for plural parallel power. 4,186,336, Cl. 323-15.000.
Weinrich, Erwin: *See*—
Tesmann, Holger; Weinrich, Erwin; and Lieske, Edgar, 4,186,186, Cl. 424-62.000.
Weir, Jimmie E. Sun shade screen. 4,185,679, Cl. 160-231.00A.
Weissel, Oskar, to Bayer Aktiengesellschaft. Process for the hydrogenation of an aromatic amine and the supported ruthenium catalyst used in the process. 4,186,145, Cl. 260-563.00D.
Weitze, Artur: *See*—
Chakrabarty, Naresh; Einzinger, Richard; and Weitze, Artur, 4,186,367, Cl. 338-21.000.
Weitzel, Steven A.: *See*—
Elms, William J.; and Weitzel, Steven A., 4,186,036, Cl. 148-6.15R.
Weitzel, Werner: *See*—
Bischlipp, Klaus; Weitzel, Werner; and Hueck, Walter, 4,185,439, Cl. 52-731.000.
Weitzman, Mark R., to Owens-Corning Fiberglas Corporation. Decorative acoustical panel for ceilings and walls. 4,186,231, Cl. 428-158.000.
Weldotron Corporation: *See*—
Budzyn, Boleslaw L., 4,185,443, Cl. 53-550.000.
Weller, Royal: *See*—
Vogt, Charles C.; and Weller, Royal, 4,185,550, Cl. 102-13.000.
Weman, Per O., to N.V. Klippan S.A. Locking device for a safety belt retractor. 4,185,792, Cl. 242-107.40B.
Wenz, William. Tong head assembly. 4,185,985, Cl. 65-172.000.
Wenzel, Wolfgang: *See*—
Reischl, Artur; Wenzel, Wolfgang; and Dieterich, Dieter, 4,186,118, Cl. 260-29.2TN.
Werner, Peter: *See*—
Sohner, Gerhard; Hohne, Gerd; Werner, Peter; Gorille, Ingo; and Roozenbeek, Herman, 4,185,603, Cl. 123-148.00E.
West Electric Company, Ltd.: *See*—
Maruyama, Yuji, 4,186,328, Cl. 315-151.000.
West, Gordon B.; and Peters, Ralph H., to General Atomic Company. Nuclear reactors. 4,186,050, Cl. 176-62.000.
Western Electric Company: *See*—
Ballard, James R., 4,186,278, Cl. 179-18.0ET.
Westinghouse Electric Corp.: *See*—
Engel, Joseph C.; and Hines, George, 4,186,431, Cl. 362-223.000.
Lyon, Ward L., 4,185,926, Cl. 366-101.000.
McMullin, Paul G., 4,186,409, Cl. 357-38.000.
Nagel, George W., 4,185,770, Cl. 236-1.00G.
Petro, John, 4,186,327, Cl. 315-73.000.
Smith, Richard C.; and Kanter, Ira E., 4,186,303, Cl. 250-253.000.
White, Peter M.; and Timmins, David L., to Tektronix, Inc. Wide range, quick response temperature probe sensor. 4,186,368, Cl. 338-28.000.
White, William A.: *See*—
Eadie, Brian K. M.; Parker, William H. C.; and White, William A., 4,185,449, Cl. 57-125.000.
Wiater, Alfons M.; Paternoster, Nicholas L.; and Pasko, Walter J., to General Electric Company. Cooler fan noise suppressor. 4,185,688, Cl. 165-122.000.
Wickman Machine Tool Sales Ltd.: *See*—
Gilbert, Harold J., 4,185,366, Cl. 29-35.500.
Widen, Bo G.: *See*—
Tranberg, Erik R.; and Widen, Bo G., 4,185,481, Cl. 70-379.00R.
Wilford, William P., to Mettoy Company Limited, The. Retention of articles on a sheet. 4,185,739, Cl. 206-45.140.
Wilkes, Robert D.; Smith, Eugene C.; and Ufford, David E., to Jacuzzi Brothers, Inc. Submersible pump check valve. 4,185,655, Cl. 137-315.000.
Wilkinson, David B., to United States of America, Air Force. Turbojet engine with combustor bypass. 4,185,461, Cl. 60-261.000.
Williams, Alan: *See*—
Komodromos, Costa; Williams, Alan; and Parkyns, Norman, 4,185,967, Cl. 48-214.00A.
Williams, Robert W. Apparatus for cleaning up animal feces deposits. 4,185,355, Cl. 15-344.000.
Williams, Rodney B.; and Taylor, Jerry A., to Dixon "Y" Machine, Incorporated. Row crop harvester with adjustable picking heads. 4,185,696, Cl. 171-38.000.
Williams, Rodney B.; and Taylor, Jerry A., to Dixon "Y" Machine, Incorporated. Hydrostatic drive system. 4,185,713, Cl. 180-242.000.
Williamson, Tommy L.; and Rose, Harold W., to United States of America, Air Force. Quadrant detection system. 4,185,919, Cl. 356-141.000.
Willinger, Allan H., to Willinger Bros., Inc. Artificial aquarium plant, anchor and container therefor. 4,185,743, Cl. 206-423.000.
Willinger, Allan H., to Willinger Bros., Inc. Bottom aquarium filter. 4,186,093, Cl. 210-169.000.
Willinger Bros., Inc.: *See*—
Willinger, Allan H., 4,185,743, Cl. 206-423.000.
Willinger, Allan H., 4,186,093, Cl. 210-169.000.
Wilmes, Richard J., to Andersen Corporation. Weatherstrip. 4,185,416, Cl. 49-406.000.
Wilson, Alvin K. Auger construction. 4,185,707, Cl. 175-394.000.
Wilson, Louis; and Estes, Nelson N., to United States of America, Navy. Electrolytic pressure sensitive mechanism. 4,185,555, Cl. 102-18.00R.
Wilson, Robert J.: *See*—
deBuhr, Alfred P.; Meyer, Bruce R.; and Wilson, Robert J., 4,186,331, Cl. 318-52.000.
Winstone Limited: *See*—
Jones, Glyndwr M., 4,185,434, Cl. 52-405.000.
Wissinger, Waldemar: *See*—
Webermeier, Kurt; Wissinger, Waldemar; and Rulle, Otto, 4,185,951, Cl. 425-133.500.
Wittwer, Christoph F., to Cincinnati Milacron Inc. External-internal gripper. 4,185,866, Cl. 294-88.000.
Woditsch, Peter; Teichmann, Gunther; Linde, Gunter; Lailach, Gunter; and Rodi, Fritz, to Bayer Aktiengesellschaft. Fluid pigment suspensions with phosphonocarboxylic acids. 4,186,028, Cl. 106-300.000.
Wolf, Karlheinz: *See*—
Aign, Volker; Schulze, Hans; Bremer, Fritz; Hornle, Reinhold; Wolf, Karlheinz; Berlenbach, Wilhelm; and Rasche, Peter, 4,186,029, Cl. 106-308.00Q.
Woodruff, Phillip R.: *See*—
Romine, Donald J.; Davis, Donald C.; Woodruff, Phillip R.; Young, Ching T.; Bode, James D.; and Tien, Tseng Y., 4,186,071, Cl. 204-195.00S.
Woods, Thomas H.; and Aultz, Thomas R., to TRW Inc. Control circuit for multi-denomination cash dispenser. 4,185,646, Cl. 133-4.00R.
Woolley, Ronald L., to Billings Energy Corporation. Apparatus and method for transferring heat to and from a bed of metal hydrides. 4,185,979, Cl. 62-48.000.
Wright, John B.: *See*—
Hall, Charles M.; and Wright, John B., 4,186,127, Cl. 260-239.00B.
Wright, William S., Jr.; and Yang, Elmer C., to Pacific Scientific Company. Adjustable locking strut. 4,185,720, Cl. 188-134.000.
Wulff, Helmut; and Hass, Hans-Jurgen, to Dynamit Nobel Aktiengesellschaft. Coating substances. 4,186,227, Cl. 427-388.00A.
Wulfmeier, Johannes: *See*—
Muller, Hans-Hermann; and Wulfmeier, Johannes, 4,186,056, Cl. 202-250.000.
Wurst, John W.: *See*—
Brown, Jack; Herr, John; Peterson, Wesley R.; and Wurst, John W., 4,185,575, Cl. 112-277.000.
Wurtz, Frank R. Wind generator. 4,186,313, Cl. 290-44.000.
Wusirika, Raja R.: *See*—
Chyung, Kenneth; and Wusirika, Raja R., 4,186,021, Cl. 106-39.600.
Wylain, Inc.: *See*—
Attridge, John T.; and Barnstead, John, 4,186,369, Cl. 338-274.000.
Wysocki, Bodo, to Licentia Patent-Verwaltungs-G.m.b.H. Amplitude modulated transmitter. 4,186,346, Cl. 325-144.000.
Xerox Corporation: *See*—
Batchelor, Phillip J., 4,186,299, Cl. 235-304.100.
Marsh, Dana G.; and Pochan, John M., 4,186,003, Cl. 430-97.000.
Miller, Roger L.; and Bean, Lloyd F., 4,185,916, Cl. 355-3.0DD.
Taylor, Thomas N.; Mahler, Charles J.; and Stana, James M., 4,185,908, Cl. 355-3.00R.
Yahagi, Mitsuhisa: *See*—
Motomura, Kenichi; Yahagi, Mitsuhisa; and Sogi, Toshiyuki, 4,185,677, Cl. 152-362.00R.
Yamada, Minoru, to Yamaha Hatsudoki Kabushiki Kaisha. Carburetor with modified venturi for its principal nozzle. 4,186,158, Cl. 261-23.00A.
Yamada, Noboru: *See*—
Yokoyama, Kazumasa; Iwai, Masakazu; Okamoto, Hiroyuki; and Yamada, Noboru, 4,186,253, Cl. 435-240.000.
Yamada, Shigeru: *See*—
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Aoki, Eiichiro; and Yamaga, Eiichi, 4,185,532, Cl. 84-1.260.
Yamaga, Eiichi: *See*—
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Aoki, Eiichiro; and Yamaga, Eiichi, 4,185,532, Cl. 84-1.260.
Yamaguchi, Hiroji; Kato, Kikuo; and Kagata, Tooru, to Aisin Seiki Kabushiki Kaisha. Wheel hub clutching mechanism. 4,185,727, Cl. 192-89.00B.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Yamada, Minoru, 4,186,158, Cl. 261-23.00A.
Yamamoto, Haruhisa; and Akiyama, Shinichi, to Nippon Zeon Co., Ltd. Oxidation of olefins. 4,186,152, Cl. 260-604.00R.
Yamanari, Koichiro: *See*—
Agui, Wataru; Higosaki, Nobuyuki; Yamanari, Koichiro; Furukawa, Toshio; and Kuyama, Hiroshi, 4,186,167, Cl. 264-141.000.
Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Kubo, Kazuo; Ito, Noriki; Souzu, Isao; Isomura, Yasuo; Homma, Hiroshige; and Murakami, Masuo, 4,186,200, Cl. 424-256.000.
Yamashita, Hidetaka; and Miura, Yuji, to Hitachi, Ltd. Switching network. 4,186,382, Cl. 340-166.00R.

Yamazaki, Akihiro; Morisawa, Hirokazu; Oda, Yoshio; and Uchida, Keiichi, to Asahi Glass Company Limited; and Ajinomoto Company Incorporated. Process for producing 5-fluorouracil. 4,186,266, Cl. 544-313.000.

Yang, Elmer C.: *See*—
Wright, William S., Jr.; and Yang, Elmer C., 4,185,720, Cl. 188-134.000.

Yang, Seung H. Boot stretcher. 4,185,347, Cl. 12-114.600.

Yates, Derek N.; and Presta, John C., to Celanese Corporation. Fiber reinforced composite shaft with metallic connector sleeves mounted by radial pin interlock. 4,185,472, Cl. 64-1.00S.

Yazaki, Mitsuyoshi: *See*—
Nakamura, Masayoshi; Yazaki, Mitsuyoshi; and Ogoshi, Toshiaki, 4,186,114, Cl. 252-536.000.

Yearian, William C., to Sandoz, Inc. Virus insecticide composition. 4,186,195, Cl. 424-93.000.

Yelke, Edward, to Creative Tool Company. Diagnostic system for fuel injected engines. 4,185,494, Cl. 73-119.00A.

Yih, Roy Y.: *See*—
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,185,995, Cl. 71-124.000.

Yokota, Shizuo: *See*—
Nakako, Yukio; Motonaga, Kenjiro; Nada, Junichiro; Ohzawa, Toshio; Yokota, Shizuo; and Kakunai, Haruo, 4,185,395, Cl. 34-12.000.

Yokoyama, Kazumasa; Iwai, Masakazu; Okamoto, Hiroyuki; and Yamada, Noboru, to Green Cross Corporation, The. Perfusate for preserving organ to be transplanted and preserving method. 4,186,253, Cl. 435-240.000.

Yokoyama, Naruo: *See*—
Atsukawa, Masumi; Nishimoto, Yoshihiko; Yokoyama, Naruo; and Sera, Toshikuni, 4,186,109, Cl. 252-440.000.

Yonkers, Robert A.; and Mattano, Leonard A., to Bissell, Inc. Fabric cleaner. 4,185,932, Cl. 401-21.000.

York, Ray A.; and Simmons, William D., to Bertea Corporation. Actuator with frangible gland construction. 4,185,542, Cl. 92-166.000.

Yoshida, Akihiko; and Nishino, Atsushi, to Matsushita Electric Industrial Company, Limited. Solid electrolyte capacitor using oxide of Ru, Rh, Re, Os or Ir as electrolyte. 4,186,423, Cl. 361-433.000.

Yoshida, Hidemasa: *See*—
Taoka, Tadami; Nakajima, Fumio; Kawamura, Hisashki; Hirano, Yutaka; Maru, Kimio; Arita, Kazutoshi; and Yoshida, Hidemasa, 4,186,305, Cl. 250-311.000.

Yoshimura, Tadashi: *See*—
Kondo, Mikio; and Yoshimura, Tadashi, 4,186,362, Cl. 335-205.000.

Yoshino Kogyosho Co., Ltd.: *See*—
Nozawa, Takamitsu, 4,185,776, Cl. 239-333.000.

Yost, William H.: *See*—
Schwartz, Theodore F., 4,185,912, Cl. 355-28.000.

Young, Ching T.: *See*—
Romine, Donald J.; Davis, Donald C.; Woodruff, Phillip R.; Young, Ching T.; Bode, James D.; and Tien, Tseng Y., 4,186,071, Cl. 204-195.00S.

Young, Craig A.: *See*—
Young, Ray A.; and Young, Craig A., 4,185,608, Cl. 124-16.000.

Young, Gary C.: *See*—
Crumb, Robert E.; Martin, William L.; and Young, Gary C., 4,185,693, Cl. 166-259.000.

Young, Lyle M. Electrically controlled drain and vent system for sinks and the like. 4,185,336, Cl. 4-286.000.

Young, Lyle M. Anti-siphoning device for venting drain lines. 4,185,654, Cl. 137-218.000.

Young, Ray A.; and Young, Craig A., to Omnitec Products Corporation. Spring type ball projecting device. 4,185,608, Cl. 124-16.000.

Young, Raymond E. Portable, adjustable backrest for beds and the like. 4,185,342, Cl. 5-433.000.

Young, Ronald F.: *See*—
Gonzalez, John; Young, Ronald F.; and Amata, Mario A., 4,186,293, Cl. 219-146.240.

Younkin, James R. Spherical display for artificial horizon indicator. 4,185,394, Cl. 33-329.000.

Zabava, Jury G.; Kogan, Rem N.; Lurie, Dzhan A.; Surkov, Viktor G.; Bratslavskaya, Elvira A.; Barabash, Ivan M.; Rodnyanksy, Ilya G.; Maljukyavichjus, Antanas A.; Voitenko, Egor T.; Anisovich, Gennady A.; Bevza, Vladimir F.; Tutov, Vadim I.; Grinberg, Valentin A.; Marukovich, Evgeny I.; and Senkin, Nikolai A. Machine for continuous casting by drawing-up. 4,185,684, Cl. 164-263.000.

Zabsky, John M.; and Marshall, John R., to Dresser Industries, Inc. Low noise fluid pressure reducer. 4,185,664, Cl. 138-40.000.

Zaffaroni, Alejandro, to Alza Corporation. Selective administration of drug with ocular therapeutic system. 4,186,184, Cl. 424-14.000.

Zambrano, Adolfo R., to Hanna Mining Company, The. Arsenic and sulfur elimination from cobaltiferous ores. 4,185,996, Cl. 75-2.000.

Zeelen, Filippus J.; and Groen, Marinus B., to Akzona Incorporated. Cyclization substrates and 6α-substituted 19-norsteroid derivatives. 4,186,142, Cl. 260-397.500.

Zeidler, Ulrich; and Scheuermann, Fanny, to Henkel Kommanditgesellschaft Auf Aktien. Stable aqueous or aqueous-alcoholic solutions of fat-soluble perfume oils or drugs containing N-(hydroxyalkyl)amide-ethoxylates. 4,186,207, Cl. 424-284.000.

Zeigler, George E., Jr.; and Hutcherson, Henry S., to Fieldcrest Mills, Inc. Method for hemming fabric using a hot melt adhesive. 4,186,043, Cl. 156-204.000.

Zellers, Dale A.; and Clark, Joseph W., to Phillips Petroleum Company. Fractionation of methyl-mercaptan reactor effluent. 4,186,061, Cl. 203-96.000.

Zenith Radio Corporation: *See*—
Barinek, Robert F., 4,186,414, Cl. 358-248.000.

Zepell, Nathan A. Flat, multi-element writing instrument. 4,185,933, Cl. 401-104.000.

Zeus Industries Pty. Limited: *See*—
Karpisek, Ladislav S., 4,185,546, Cl. 99-386.000.

Ziegler, Peter; Attwell, Michael C.; Massiah, Thomas F.; and Vergottini, Roberto A., to Canada Packers Limited. Chenodeoxycholic acid recovery process. 4,186,143, Cl. 260-397.100.

Ziggity Systems, Inc.: *See*—
Hostetler, Eldon, 4,185,590, Cl. 119-81.000.

Zimmerman, Robert L.: *See*—
Cuscurida, Michael; and Zimmerman, Robert L., 4,186,254, Cl. 521-115.000.

Zintz, Howard; Fisher, Richard C.; and Gee, John F., to NL Industries, Inc. Subaqueous sequence valve mechanism. 4,185,652, Cl. 137-81.000.

Zissimopoulos, Nick, to Baxter Travenol Laboratories, Inc. Fluid-flow limiting apparatus for use with intravenous-solution administering equipment. 4,185,759, Cl. 222-450.000.

0-3 Company: *See*—
Harter, Joseph W., III; and Beitzel, Stuart W., 4,186,070, Cl. 204-176.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF JANUARY, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Flora, Elvis C.: *See*—
Oliver, Roy N.; Flora, Elvis C.; Powell, Paul A.; and Spain, Roy C., Re. 30,198, Cl. 70-364.00A.

Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA): *See*—
Rose, David; Saygin, Ferdi; and Weinrich, Erwin, Re. 30,199, Cl. 8-10.200.

Mechanical Development Co., Inc.: *See*—
Oliver, Roy N.; Flora, Elvis C.; Powell, Paul A.; and Spain, Roy C., Re. 30,198, Cl. 70-364.00A.

Oliver, Roy N.; Flora, Elvis C.; Powell, Paul A.; and Spain, Roy C., to Mechanical Development Co., Inc. Cylinder lock. Re. 30,198, Cl. 70-364.00A.

Powell, Paul A.: *See*—
Oliver, Roy N.; Flora, Elvis C.; Powell, Paul A.; and Spain, Roy C., Re. 30,198, Cl. 70-364.00A.

Rose, David; Saygin, Ferdi; and Weinrich, Erwin, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Oxidation hair dyes based upon tetraaminopyrimidine developers. Re. 30,199, Cl. 8-10.200.

Saygin, Ferdi: *See*—
Rose, David; Saygin, Ferdi; and Weinrich, Erwin, Re. 30,199, Cl. 8-10.200.

Spain, Roy C.: *See*—
Oliver, Roy N.; Flora, Elvis C.; Powell, Paul A.; and Spain, Roy C., Re. 30,198, Cl. 70-364.00A.

Weinrich, Erwin: *See*—
Rose, David; Saygin, Ferdi; and Weinrich, Erwin, Re. 30,199, Cl. 8-10.200.

LIST OF PLANT PATENTEES

Gesellschaftsvertrag uber die Erfindergemeinschaft "OPTIMARA": *See*—
Holtkamp, Reinhold, 4,498, Cl. 69.000.

Gessellschaftsvertrag uber die Erfindergemeinschaft "OPTIMARA": *See*—
Holtkamp, Reinhold, 4,497, Cl. 69.000.

Holtkamp, Reinhold, to Gessellschaftsvertrag uber die Erfindergemeinschaft "OPTIMARA". African violet plant. 4,497, 1-29-80, Cl. 69.000.

Holtkamp, Reinhold, to Gesellschaftsvertrag uber die Erfindergemeinschaft "OPTIMARA". African violet plant. 4,498, 1-29-80, Cl. 69.000.

LIST OF DESIGN PATENTEES

Abu Aktiebolag: *See*—
Jansson, Bertil E.; and Carlsson, Karl L. O., 254,091, Cl. D22-25.000.

Acme United Corporation: *See*—
Perry, Angelo, 254,090, Cl. D24-27.000.

Adams, Ronald J. Underwater console attaching slate board. 254,093, 1-29-80, Cl. D21-236.000.

Alice Jewelry: *See*—
Pisano, Pasquale E.; and Demers, James, 254,055, Cl. D11-88.000.

Anderson, Lloyd E. Arcuate cutting tool. 254,049, 1-29-80, Cl. D8-98.000.

Anton, Marta K. Article carrier for motor-bike. 254,062, 1-29-80, Cl. D12-158.000.

Anziano, Robert C., to Transportation Special Products Inc. Air deflector for trucks. 254,063, 1-29-80, Cl. D12-181.000.

Bales, William T., to Plantables, Inc. Three dimensional topiary figure. 254,056, 1-29-80, Cl. D11-149.000.

Barr, Josef J. Necklace or similar article. 254,054, 1-29-80, Cl. D11-6.000.

Bartholomew, Gary, to Bartholomew Mfg. Co., Inc. Photographic illuminating and comparing device. 254,075, 1-29-80, Cl. D16-17.000.

Bartholomew Mfg. Co., Inc.: *See*—
Bartholomew, Gary, 254,075, Cl. D16-17.000.

Beall, Lester, to Modern Angel Furniture Manufacturing, Inc. Sofa. 254,039, 1-29-80, Cl. D6-57.000.

Beall, Lester, to Modern Angel Furniture Manufacturing, Inc. Sofa. 254,040, 1-29-80, Cl. D6-57.000.

Beall, Lester, to Modern Angel Furniture Manufacturing, Inc. Sofa. 254,041, 1-29-80, Cl. D6-57.000.

Berghoff, Benjamin J. Attachable holder for tools and accessories for a printing press or the like. 254,079, 1-29-80, Cl. D18-22.000.

Berry, Lambert D. Toilet exhauster. 254,089, 1-29-80, Cl. D23-69.000.

Breitenkam, Fred J.; and Landrith, James E., to Van Dyk Research Corporation. Malfunction display panel for xerographic copying machine. 254,076, 1-29-80, Cl. D16-32.000.

Cantwell, Colin: *See*—
Johnston, Joseph; and Cantwell, Colin, 254,080, Cl. D21-87.000.
Johnston, Joseph; and Cantwell, Colin, 254,081, Cl. D21-87.000.

Carlsson, Karl L. O.: *See*—
Jansson, Bertil E.; and Carlsson, Karl L. O., 254,091, Cl. D22-25.000.

Clementson, Ray S., to R. E. Miller Pty. Limited. Claw-ball for use with a camera mounting. 254,077, 1-29-80, Cl. D16-46.000.

Clifton, John T., to CS Yachts Limited. Hot water extraction rug cleaner. 254,073, 1-29-80, Cl. D15-52.000.

CS Yachts Limited: *See*—
Clifton, John T., 254,073, Cl. D15-52.000.

Dadson, Roland, to Hozelock Limited. Lawn sprinkler. 254,087, 1-29-80, Cl. D23-8.000.

Demers, James: *See*—
Pisano, Pasquale E.; and Demers, James, 254,055, Cl. D11-88.000.

Euwema, George J.; and Euwema, George W. Table attachable seat for a child. 254,036, 1-29-80, Cl. D6-9.000.

Euwema, George W.: *See*—
Euwema, George J.; and Euwema, George W., 254,036, Cl. D6-9.000.

Fitzgerald, Harry H. Wedge to hold a gas pump nozzle in the open position. 254,050, 1-29-80, Cl. D8-349.000.

Genaro, Donald M.; and Peets, Robert S., to Singer Company, The. Multi-use sewing cabinet. 254,043, 1-29-80, Cl. D6-164.000.

General Electric Company: *See*—
Hauenstein, Max C., 254,048, Cl. D7-139.000.

General Research of Electronics, Inc.: *See*—
Imazeki, Kazuyoshi, 254,071, Cl. D14-71.000.

GTE Automatic Electric Laboratories Incorporated: *See*—
Janda, George M., 254,067, Cl. D14-60.000.

Haley, Ellis R. Telephone instrument supported hand set holder. 254,068, 1-29-80, Cl. D14-65.000.

Haley, Ellis R. Wall attachable telephone hand set holder. 254,069, 1-29-80, Cl. D14-65.000.

Hans Grohe GmbH & Co. KG: *See*—
Haug, Andreas, 254,088, Cl. D23-29.000.

Hauenstein, Max C., to General Electric Company. Electric peeling wand or similar article. 254,048, 1-29-80, Cl. D7-139.000.

Haug, Andreas, to Hans Grohe GmbH & Co. KG. Handle for a water faucet. 254,088, 1-29-80, Cl. D23-29.000.

Heap, Jean W., to Pendelfin Studios Limited. Rabbit figure. 254,057, 1-29-80, Cl. D11-158.000.

Hodgkins, David H., to Stanadyne, Inc. Fuel oil filter. 254,086, 1-29-80, Cl. D23-4.000.
Honeywell Inc.: *See*—
Wolfe, Norbert T., 254,052, Cl. D10-51.000.
Hosoe, Isao, to Sacea S.a.s. di Tirinnanzi Giampietro & C. Chair. 254,038, 1-29-80, Cl. D6-31.000.
Hosoe, Isao, to Sacea S.a.s. di Tirinnanzi Giampietro & C. Chair. 254,042, 1-29-80, Cl. D6-69.000.
Houck, Beulah O. Gameboard. 254,085, 1-29-80, Cl. D21-241.000.
Hozelock Limited: *See*—
Dadson, Roland, 254,087, Cl. D23-8.000.
Hulyk, Myron. Golf club head. 254,084, 1-29-80, Cl. D21-217.000.
Igo, Toshio; and Ohta, Kikuo, to Matsushita Electric Industrial Co., Ltd. Motor vehicular citizens' band transceiver. 254,070, 1-29-80, Cl. D14-68.000.
Igo, Toshio: *See*—
Ohta, Kikuo; Igo, Toshio; and Usami, Satoru, 254,065, Cl. D14-5.000.
Imazeki, Kazuyoshi, to General Research of Electronics, Inc. Digital entry programmable scanning radio receiver or the like. 254,071, 1-29-80, Cl. D14-71.000.
International Silver Company: *See*—
Young, Stuart A., 254,047, Cl. D7-39.000.
Jaksich, Milenko, to Sight Lite, Inc. Adjustable floodlight. 254,094, 1-29-80, Cl. D48-20.00K.
Janda, George M., to GTE Automatic Electric Laboratories Incorporated. Telephone instrument housing. 254,067, 1-29-80, Cl. D14-60.000.
Jansson, Bertil E.; and Carlsson, Karl L. O., to Abu Aktiebolag. Fishing reel. 254,091, 1-29-80, Cl. D22-25.000.
Johnston, Joseph; and Cantwell, Colin, to Twentieth Century-Fox Film Corporation. Toy spacecraft. 254,080, 1-29-80, Cl. D21-87.000.
Johnston, Joseph; and Cantwell, Colin, to Twentieth Century-Fox Film Corporation. Toy spacecraft. 254,081, 1-29-80, Cl. D21-87.000.
K-tel International, Inc.: *See*—
Koblick, Jeffrey M., 254,082, Cl. D21-127.000.
Koblick, Jeffrey M., 254,083, Cl. D21-127.000.
Keller, Huey T., to Vaughan Furniture Company, Inc. Headboard. 254,045, 1-29-80, Cl. D6-198.000.
Keller, Huey T., to Vaughan Furniture Company, Inc. Headboard. 254,046, 1-29-80, Cl. D6-198.000.
Koblick, Jeffrey M., to K-tel International, Inc. Toy writing instrument. 254,082, 1-29-80, Cl. D21-127.000.
Koblick, Jeffrey M., to K-tel International, Inc. Combined toy writing instrument and stand therefor. 254,083, 1-29-80, Cl. D21-127.000.
Kohlman, Russell H. Telephone for vehicles. 254,066, 1-29-80, Cl. D14-53.000.
Krupotich, Edward A., to Omation Corporation. Envelope power stacker. 254,059, 1-29-80, Cl. D12-58.000.
Landrith, James E.: *See*—
Breitenkam, Fred J.; and Landrith, James E., 254,076, Cl. D16-32.000.
Langlois, A. Edward, Jr. Figurine. 254,058, 1-29-80, Cl. D11-160.000.
Lawson, Loren J. Display case. 254,044, 1-29-80, Cl. D6-173.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Igo, Toshio; and Ohta, Kikuo, 254,070, Cl. D14-68.000.
Ohta, Kikuo; Igo, Toshio; and Usami, Satoru, 254,065, Cl. D14-5.000.
Modern Angel Furniture Manufacturing, Inc.: *See*—
Beall, Lester, 254,039, Cl. D6-57.000.
Beall, Lester, 254,040, Cl. D6-57.000.
Beall, Lester, 254,041, Cl. D6-57.000.
Muraski, Richard E.: *See*—
Spellins, Charlene; and Muraski, Richard E., 254,060, Cl. D12-96.000.
Nadler, Joseph B. Tire. 254,061, 1-29-80, Cl. D12-137.000.
Northern Telecom Limited: *See*—
Slade, Ross J., 254,092, Cl. D25-77.000.
Ohta, Kikuo; Igo, Toshio; and Usami, Satoru, to Matsushita Electric Industrial Co., Ltd. Combined motor vehicular cartridge or cassette player and citizens' band transceiver or the like. 254,065, 1-29-80, Cl. D14-5.000.
Ohta, Kikuo: *See*—
Igo, Toshio; and Ohta, Kikuo, 254,070, Cl. D14-68.000.
Omation Corporation: *See*—
Krupotich, Edward A., 254,059, Cl. D12-58.000.
Peets, Robert S.: *See*—
Genaro, Donald M.; and Peets, Robert S., 254,043, Cl. D6-164.000.
Pendelfin Studios Limited: *See*—
Heap, Jean W., 254,057, Cl. D11-158.000.
Perry, Angelo, to Acme United Corporation. Surgical instrument. 254,090, 1-29-80, Cl. D24-27.000.
Pisano, Pasquale E.; and Demers, James, to Alice Jewelry. Ear clip. 254,055, 1-29-80, Cl. D11-88.000.
Plantables, Inc.: *See*—
Bales, William T., 254,056, Cl. D11-149.000.
R. E. Miller Pty. Limited: *See*—
Clementson, Ray S., 254,077, Cl. D16-46.000.
Retzlaff, Ronald D., to Tru-Spoke, Inc. Spoked vehicle wheel. 254,064, 1-29-80, Cl. D12-205.000.
Ricoh Company, Ltd.: *See*—
Saito, Yasuhiro, 254,072, Cl. D14-94.000.
Ringle, Gerald D. Drill guide for removing broken studs from automotive manifolds. 254,074, 1-29-80, Cl. D15-138.000.
Sacea S.a.s. di Tirinnanzi Giampietro & C.: *See*—
Hosoe, Isao, 254,038, Cl. D6-31.000.
Hosoe, Isao, 254,042, Cl. D6-69.000.
Saito, Yasuhiro, to Ricoh Company, Ltd. Facsimile with transceiver. 254,072, 1-29-80, Cl. D14-94.000.
Sight Lite, Inc.: *See*—
Jaksich, Milenko, 254,094, Cl. D48-20.00K.
Singer Company, The: *See*—
Genaro, Donald M.; and Peets, Robert S., 254,043, Cl. D6-164.000.
Slade, Ross J., to Northern Telecom Limited. Terminal post. 254,092, 1-29-80, Cl. D25-77.000.
Spellins, Charlene; and Muraski, Richard E. Truck cab. 254,060, 1-29-80, Cl. D12-96.000.
Stanadyne, Inc.: *See*—
Hodgkins, David H., 254,086, Cl. D23-4.000.
Transportation Special Products Inc.: *See*—
Anziano, Robert C., 254,063, Cl. D12-181.000.
Tripod, Billie C. Combined watch face and hands. 254,053, 1-29-80, Cl. D10-124.000.
Tru-Spoke, Inc.: *See*—
Retzlaff, Ronald D., 254,064, Cl. D12-205.000.
Twentieth Century-Fox Film Corporation: *See*—
Johnston, Joseph; and Cantwell, Colin, 254,080, Cl. D21-87.000.
Johnston, Joseph; and Cantwell, Colin, 254,081, Cl. D21-87.000.
Usami, Satoru: *See*—
Ohta, Kikuo; Igo, Toshio; and Usami, Satoru, 254,065, Cl. D14-5.000.
Van Dyk Research Corporation: *See*—
Breitenkam, Fred J.; and Landrith, James E., 254,076, Cl. D16-32.000.
Van Exel, Gerrit A. Slide frame for calculator or the like. 254,078, 1-29-80, Cl. D18-9.000.
Vaughan Furniture Company, Inc.: *See*—
Keller, Huey T., 254,045, Cl. D6-198.000.
Keller, Huey T., 254,046, Cl. D6-198.000.
Wolfe, Norbert T., to Honeywell Inc. Room thermostat. 254,052, 1-29-80, Cl. D10-51.000.
Woods, Ivan D. Soap bar holder. 254,037, 1-29-80, Cl. D6-27.000.
Wurster, David W. Toy bank. 254,095, 1-29-80, Cl. D99-37.000.
Young, Stuart A., to International Silver Company. Casserole holder. 254,047, 1-29-80, Cl. D7-39.000.
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CLASSIFICATION OF PATENTS

ISSUED JANUARY 29, 1980

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2 4,185,327
8 4,185,328
4,185,329
164 4,185,330
411 4,185,331

CLASS 3

36 4,185,332

CLASS 4

172.15 4,185,333
191 4,185,334
251 4,185,335
286 4,185,336
300 4,185,337
327 4,185,338
378 4,185,339
441 4,185,340

CLASS 5

433 4,185,342
461 4,185,341

CLASS 6

10 4,185,343

CLASS 8

2.5 R 4,185,957
10.1 4,185,958
10.2 Re.30,199
26 4,185,959
111 4,185,960
115.5 4,185,961
149.1 4,185,344
171 4,185,962

CLASS 9

1.7 4,185,346
8 R 4,185,345

CLASS 12

114.6 4,185,347

CLASS 15

101 4,185,348
106 4,185,349
236 C 4,185,350
243 4,185,351
246.5 4,185,352
250.36 4,185,353
321 4,185,354
344 4,185,355

CLASS 16

52 4,185,356
130 4,185,357

CLASS 17

42 4,185,358
51 4,185,359

CLASS 23

230 B 4,185,963
4,185,964

CLASS 24

68 CD 4,185,360
73 SG 4,185,361
134 L 4,185,362
230 A 4,185,363

CLASS 28

218 4,185,364

CLASS 29

25.15 4,185,365
35.5 4,185,366
91.1 4,185,367
156.7 R 4,185,368
156.8 B 4,185,369
159.1 4,185,370
235 4,185,371
275 4,185,372
423 4,185,373
434 4,185,374
450 4,185,375
568 4,185,376
4,185,377
626 4,185,378

CLASS 30

134 4,185,379
347 4,185,380
4,185,381
383 4,185,382

CLASS 32

22 4,185,385
32 4,185,387
59 4,185,388

CLASS 33

21 R 4,185,389
139 4,185,390
168 R 4,185,391
174 B 4,185,392
178 R 4,185,393
329 4,185,394

CLASS 34

12 4,185,395
57 R 4,185,396
77 4,185,397
103 4,185,398
120 4,185,399

CLASS 35

5 4,185,400
31 C 4,185,401

CLASS 36

44 4,185,402

CLASS 37

53 4,185,403
71 4,185,404

CLASS 40

2.2 4,185,405
361 4,185,406
367 4,185,407
564 4,185,408

CLASS 44

63 4,185,965

CLASS 46

1 K 4,185,409
23 4,185,410
4,185,411
116 4,185,412
118 4,185,413

CLASS 47

62 4,185,414

CLASS 48

212 4,185,966
214 A 4,185,967

CLASS 49

248 4,185,415
406 4,185,416
470 4,185,417
501 4,185,418

CLASS 51

5 R 4,185,419
316 4,185,968

CLASS 52

11 4,185,420
4,185,421
36 4,185,422
79.9 4,185,423
103 4,185,425
103 R 4,185,424
115 4,185,426
4,185,427
233 4,185,428
274 4,185,429
285 4,185,430
309.17 4,185,431
400 4,185,432
404 4,185,433
405 4,185,434
507 4,185,435
518 4,185,436
601 4,185,437
704 4,185,438
731 4,185,439
741 4,185,440

CLASS 53

79 4,185,441
168 4,185,442
550 4,185,443

CLASS 54

37 4,185,444

CLASS 55

31 4,185,969
89 4,185,970
113 4,185,971
155 4,185,972
212 4,185,973
216 4,185,974
238 4,185,975
373 4,185,976

CLASS 56

6 4,185,445
344 4,185,446
376 4,185,447
400.12 4,185,448

CLASS 57

125 4,185,449
247 4,185,450
310 4,185,451

CLASS 58

23 R 4,185,452
35 R 4,185,453

CLASS 59

1 4,185,454

CLASS 60

39.02 4,185,456
39.06 4,185,455
204 4,185,457
224 4,185,460
261 4,185,458
4,185,461
4,185,462
280 4,185,459
322 4,185,463
496 4,185,464
678 4,185,465

CLASS 62

23 4,185,977
28 4,185,978
48 4,185,979
55.5 4,185,466
81 4,185,467
123 4,185,468
174 4,185,469
496 4,185,470

CLASS 63

14 C 4,185,471

CLASS 64

1 S 4,185,472
2 R 4,185,473
4 4,185,474
21 4,185,475
4,185,476
28 R 4,185,477

CLASS 65

1 4,185,980
5 4,185,981
29 4,185,982
104 4,185,983
135 4,185,984
172 4,185,985
287 4,185,986

CLASS 70

38 A 4,185,478
95 4,185,479
358 4,185,480
364 A Re.30,198
379 R 4,185,481
394 4,185,482
416 4,185,483

CLASS 71

24 4,185,987
27 4,185,988
88 4,185,989
90 4,185,990
92 4,185,991
4,185,992
93 4,185,993
118 4,185,994
124 4,185,995

CLASS 72

40 4,185,484
42 4,185,485
71 4,185,486
315 4,185,487
350 4,185,488

CLASS 73

2 4,185,489
23.1 4,185,490
27 R 4,185,491
46 4,185,492
56 4,185,493
119 A 4,185,494
126 4,185,495
141 A 4,185,496
190 EW 4,185,497
194 A 4,185,498
229 4,185,499
422 GC 4,185,500
641 4,185,501
644 4,185,502
653 4,185,503
761 4,185,504
4,185,505
4,185,506

CLASS 74

2 4,185,507
53 4,185,508
200 4,185,509
217 B 4,185,510
242.14 R 4,185,511
411.5 4,185,512
425 4,185,513
4,185,514
501 P 4,185,515
501.5 R 4,185,516
512 4,185,517
516 4,185,518
577 S 4,185,519
750 R 4,185,520
865 4,185,521

CLASS 75

0.5 B 4,186,000
2 4,185,996
24 4,185,997
124 4,185,998
148 4,185,999

CLASS 81

9.51 4,185,522
417 4,185,523

CLASS 82

2 R 4,185,524
4 C 4,185,525
44 4,185,526

CLASS 83

88 4,185,527
168 4,185,528

CLASS 84

1.01 4,185,529
1.03 4,185,530
1.11 4,185,531
1.26 4,185,532
83 4,185,533
291 4,185,534
383 R 4,185,535

CLASS 85

83 4,185,536

CLASS 89

1.810 4,185,538
145 4,185,537

CLASS 91

45 4,185,539
497 4,185,540
526 4,185,541

CLASS 92

128 4,185,543
166 4,185,542
220 4,185,544

CLASS 96

33 4,186,250
74 4,186,016

CLASS 98

33 A 4,185,545

CLASS 99

386 4,185,546
453 4,185,547

CLASS 100

27 4,185,548
45 4,185,549

CLASS 102

13 4,185,550
15 4,185,551
18 M 4,185,552
4,185,556
18 MS 4,185,554
18 R 4,185,553
4,185,555
103 4,185,557
105 4,185,558
211 4,185,559
214 4,185,560

CLASS 104

153 4,185,561

CLASS 105

152 4,185,562
345 4,185,563

CLASS 106

22 4,186,020
39.6 4,186,021
43 4,186,022
53 4,186,023
162 4,186,024
4,186,025
287.14 4,186,026
288 B 4,186,027
300 4,186,028
308 Q 4,186,029

CLASS 108

51.3 4,185,565
152 4,185,566

CLASS 110

101 R 4,185,567

CLASS 112

79 R 4,185,568
4,185,569
121.26 4,185,570
158 B 4,185,571
158 E 4,185,572
183 4,185,573
225 4,185,574
277 4,185,575

CLASS 113

1 D 4,185,576

CLASS 114

211 4,185,579
230 4,185,577
245 4,185,578
321 4,185,580

CLASS 116

22 A 4,185,581
210 4,185,582
225 4,185,583
272 4,185,584

CLASS 118

50.1 4,185,585

CLASS 119

14.08 4,185,586
51.11 4,185,587
51.12 4,185,588
73 4,185,589
81 4,185,590
98 4,185,591
148 4,185,592

CLASS 123

1 A 4,185,593
4,185,594
3 4,185,595
51 B 4,185,596
68 4,185,597
73 A 4,185,598
75 B 4,185,599
119 A 4,185,604
146.5 A 4,185,600
4,185,601
148 E 4,185,602
4,185,603
179 B 4,185,605
182 4,185,606
198 F 4,185,607

CLASS 124

16 4,185,608

CLASS 125

21 4,185,609

CLASS 126

121 4,185,610
4,185,611
122 4,185,612
181 4,185,613
265 4,185,614
424 4,185,615
443 4,185,616

CLASS 128

1 D 4,185,617
1 R 4,185,618
1.1 4,185,619
25 B 4,185,622
69 4,185,623
92 A 4,185,624
132 D 4,185,625
156 4,185,626
200.26 4,185,639
214 R 4,185,629
215 4,185,627
218 M 4,185,628
283 4,185,630
285 4,185,631
303.1 4,185,632
4,185,633
314 4,185,634
330 4,185,635
334 R 4,185,636
335.5 4,185,637
349 B 4,185,638
421 4,185,640
635 4,185,620
672 4,185,621
675 4,185,641

CLASS 130

27 R 4,185,642

CLASS 131

12 4,185,643
109 R 4,185,644
261 R 4,185,645

CLASS 133

4 R 4,185,646

CLASS 134

1 4,186,030
4,186,031
31 4,186,032
60 4,185,647
122 R 4,185,648
4,185,649

CLASS 136

89 FC 4,186,033

CLASS 137

15 4,185,650
38 4,185,651
81 4,185,652
114 4,185,653
218 4,185,654
315 4,185,655
512.3 4,185,656
601 4,185,657
4,185,658
625.17 4,185,659
625.64 4,185,660
625.65 4,185,661
636 4,185,662
882 4,185,663

CLASS 138

40 4,185,664
89 4,185,665

CLASS 139

82 4,185,666
302 4,185,667

CLASS 140

92.4 4,185,668

CLASS 141

59 4,185,669
94 4,185,670

CLASS 144

134 D 4,185,671
312 4,185,672

CLASS 148

2 4,186,034
6.15 R 4,186,036
6.16 4,186,035
12.4 4,186,037
113 4,186,038
128 4,186,039

CLASS 149

19.4 4,186,040

CLASS 150

33 4,185,673

CLASS 152

218 4,185,674
354 R 4,185,675
362 R 4,185,676
4,185,677

CLASS 156

53 4,186,041
115 4,186,042
204 4,186,043
258 4,185,718
273 4,186,044
602 4,186,045
605 4,186,046

CLASS 157

1.55 4,185,678

CLASS 159

2 E 4,186,047

CLASS 160

231 A 4,185,679

CLASS 162

5 4,185,680

CLASS 164

154 4,185,681
252 4,185,682
4,185,683
263 4,185,684

CLASS 165

1 4,185,685
7 4,185,686
8 4,185,687
122 4,185,688

CLASS 166

133 4,185,689
183 4,185,690
250 4,185,691
257 4,185,692
259 4,185,693
350 4,185,694

CLASS 168

18 4,185,695

CLASS 171

38 4,185,696

CLASS 172

10 4,185,697
71 4,185,698
724 4,185,699
796 4,185,700

CLASS 173

12 4,185,701

CLASS 175

4.54 4,185,702
17 4,185,703
76 4,185,704
78 4,185,705
340 4,185,706
394 4,185,707
410 4,185,708

CLASS 176

19 J 4,186,048
38 4,186,049
62 4,186,050
65 4,186,051

CLASS 177

145 4,185,709

CLASS 178

19 4,186,272

CLASS 179

1 D 4,186,274
1 G 4,186,273
6.3 R 4,186,275
15 AT 4,186,276
4,186,277
18 ET 4,186,278
90 B 4,186,279
100.1 R 4,186,280
100.4 ST 4,186,281
175.3 R 4,186,282
4,186,283

CLASS 180

14 A 4,185,710
131 4,185,712
214 4,185,711
242 4,185,713

CLASS 181

120 4,185,714
266 4,185,715

CLASS 182

2 4,185,716

CLASS 184

6.28 4,185,717

CLASS 188

33 4,185,719
134 4,185,720
322 4,185,721

CLASS 192

18 B 4,185,722
36 4,185,723
45 4,185,724
53 F 4,185,725
58 B 4,185,726
89 B 4,185,727
106.2 4,185,728

CLASS 193

35 A 4,185,729

CLASS 194

4 R 4,185,730

CLASS 198

304 4,185,731
455 4,185,732
477 4,185,733
484 4,185,734
789 4,185,735
811 4,185,736
814 4,185,738
831 4,185,737

CLASS 200

1 A 4,186,284
5 E 4,186,285
19 DR 4,186,286
61.62 4,186,287
61.86 4,186,291
159 A 4,186,290
164 R 4,186,288
284 4,186,289

CLASS 201

6 4,186,054

CLASS 202

248 4,186,055
250 4,186,056
263 4,186,057

CLASS 203

11 4,186,058
14 4,186,059
26 4,186,060
96 4,186,061

CLASS 204

15 4,186,062
29 4,186,063
43 G 4,186,064
98 4,186,065
4,186,066
109 4,186,067
158 R 4,186,175
159.2 4,186,068
176 4,186,070
195 S 4,186,071
4,186,072
286 4,186,074
294 4,186,075
295 4,186,076

CLASS 206

45.14 4,185,739
220 4,185,740
326 4,185,741
380 4,186,073
414 4,185,742
423 4,185,743
427 4,185,744
556 4,185,745

CLASS 208

3 4,186,077
27 4,186,078
127 4,186,079
143 4,186,080
216 R 4,186,081
310 Z 4,186,082

CLASS 209

166 4,186,083
691 4,185,746

CLASS 210

23 H 4,186,084
27 4,186,085
37 R 4,186,086
44 4,186,087
45 4,186,088
49 4,186,089
77 4,186,090
4,186,091
4,186,092
169 4,186,093
221 P 4,186,094
242 S 4,186,095
377 4,186,096
4,186,097
386 4,186,098
457 4,186,099
496 4,186,100
497 R 4,186,101

CLASS 215

253 4,185,747

CLASS 219

10.81 4,186,292
146.24 4,186,293
497 4,186,295
527 4,186,294

CLASS 220

8 4,185,748
20.5 4,185,750
72 4,185,749
203 4,185,751
314 4,185,752

CLASS 221

45 4,185,753
63 4,185,754

CLASS 222

43 4,185,755
83.5 4,185,756
107 4,185,757
386.5 4,185,758
450 4,185,759

CLASS 223

85 4,185,768

CLASS 226

109 4,185,760
181 4,185,761

CLASS 227

138 4,185,762

CLASS 229

15 4,185,763
16 R 4,185,764
17 G 4,185,765
39 B 4,185,766
39 R 4,185,767

CLASS 235

61 J 4,186,296
89 R 4,186,297
92 T 4,186,298
304.1 4,186,299

CLASS 236

1 G 4,185,769
4,185,770
12 R 4,185,771
86 4,185,772

CLASS 238

150 4,185,773

CLASS 239

184 4,185,774
308 4,185,775
333 4,185,776
394 4,185,777
405 4,185,778
533.3 4,185,779
553.5 4,185,780
600 4,185,781
663 4,185,782
704 4,185,783

CLASS 241

66 4,185,784
70 4,185,785
85 4,185,786
101.5 4,185,787
285 A 4,185,788

CLASS 242

7.11 4,185,789
53 4,185,790
107.2 4,185,791
107.4 B 4,185,792
199 4,185,793
201 4,185,794
209 4,185,795

CLASS 244

3.12 4,185,796
3.16 4,185,797
110 B 4,185,798
118.5 R 4,185,799

CLASS 248

73 4,185,800
74 A 4,185,802
289 R 4,185,801
295 R 4,185,808
608 4,185,803

CLASS 249

20 4,185,804
210 4,185,805

CLASS 250

204 4,186,300
4,186,301
213 VT 4,186,302
253 4,186,303
302 4,186,304
311 4,186,305
360 4,186,306
363 S 4,186,307
480 4,186,308
561 4,186,309
4,186,310

CLASS 251

61.1 4,185,806
218 4,185,807

CLASS 252

51.5 R 4,186,102
174.11 4,186,103
358 4,186,104
400 R 4,186,105
414 4,186,106
426 4,186,108
429 B 4,186,107
440 4,186,109
447 4,186,110
453 4,186,111
471 4,186,112
526 4,186,113
536 4,186,114

CLASS 254

134.4 4,185,809

CLASS 260

22 R 4,186,115
23 AR 4,186,116
4,186,117
29.2 TN 4,186,118
4,186,119
29.6 F 4,186,121
29.6 RB 4,186,120
31.4 R 4,186,122
37 EP 4,186,124
37 SB 4,186,123
42.18 4,186,125
45.9 AA 4,186,126
239 B 4,186,127
239.5 4,186,128
325 R 4,186,132
326.13 H 4,186,134
326.13 R 4,186,133
326.34 4,186,135
345.5 4,186,138
345.9 R 4,186,141
346.74 4,186,139
4,186,140
397.1 4,186,143
397.5 4,186,142
465.1 4,186,144
563 D 4,186,145
570.5 P 4,186,146
578 4,186,147
583 H 4,186,148
586 G 4,186,150
586 R 4,186,149
591 4,186,151
604 R 4,186,152
650 R 4,186,153
948 4,186,157

CLASS 261

23 A 4,186,158
112 4,186,159

CLASS 264

34 4,186,160
37 4,186,161
46.5 4,186,162
54 4,186,163
81 4,186,164
112 4,186,165
139 4,186,166
141 4,186,167
168 4,186,168
228 4,186,169
247 4,186,170

CLASS 266

259 4,185,810

CLASS 269

6 4,185,811
56 4,185,812
328 4,185,813

CLASS 271

108 4,185,814
225 4,185,815

CLASS 272

93 4,185,816
95 4,185,817
130 4,185,818

CLASS 273

1 A 4,185,819
1 E 4,185,820
26 R 4,185,821
73 C 4,185,822
95 R 4,185,823
101 4,185,824
101.2 4,185,825
106 B 4,185,826
129 B 4,185,827
142 J 4,185,828
142 K 4,185,829
157 R 4,185,830
235 R 4,185,831
237 4,185,832
240 4,185,833
241 4,185,834

CLASS 274

23 A 4,185,836
23 R 4,185,835

CLASS 277

27 4,185,837
58 4,185,838
105 4,185,839
125 4,185,840
167.5 4,185,841
194 4,185,842
224 4,185,843

CLASS 280

5 A 4,185,844
6 H 4,185,845
32.6 4,185,846
87.04 A 4,185,847
166 4,185,849
296 4,185,850
613 4,185,851
618 4,185,852
652 4,185,848
4,185,853
677 4,185,854
804 4,185,855

CLASS 285

18 4,185,856
363 4,185,857
367 4,185,858

CLASS 290

1 R 4,186,311
4 R 4,186,312
44 4,186,313
55 4,186,314

CLASS 292

93 4,185,859
148 4,185,860

CLASS 294

19 R 4,185,861
74 4,185,862
78 R 4,185,863
83 R 4,185,864
86.3 4,185,865
88 4,185,866

CLASS 296

137 B 4,185,868
187 4,185,867

CLASS 297

84 4,185,869
4,185,870

CLASS 299

2 4,185,871
4 4,185,872
31 4,185,873
32 4,185,874
39 4,185,875
45 4,185,876

CLASS 305

35 R 4,185,877

CLASS 307

117 4,186,315

CLASS 308

9 4,185,878
20 4,185,879
189 R 4,185,880

CLASS 310

49 R 4,186,316
60 R 4,186,317
68 C 4,186,318
89 4,186,319
93 4,186,320
178 4,186,321
194 4,186,322
324 4,186,323
329 4,186,324
331 4,186,325

CLASS 313

408 4,186,326

CLASS 315

73 4,186,327
151 4,186,328
241 R 4,186,329
411 4,186,330

CLASS 316

5 4,185,922

CLASS 318

52 4,186,331
128 4,186,332
376 4,186,333
805 4,186,334

CLASS 320

3 4,186,335

CLASS 323

15 4,186,336

CLASS 324

52 4,186,338
142 4,186,339
205 4,186,340
236 4,186,341
380 4,186,337

CLASS 325

17 4,186,342
4,186,343
20 4,186,344
37 4,186,345
144 4,186,346
305 4,186,347
320 4,186,348
323 4,186,349
383 4,186,350
398 4,186,351
446 4,186,352

CLASS 330

4.3 4,186,353
252 4,186,354

CLASS 331

94.5 H 4,186,355

CLASS 332

19 4,186,356

CLASS 333

24.1 4,186,357
33 4,186,358
134 4,186,359

CLASS 334

55 4,186,360

CLASS 335

179 4,186,361
205 4,186,362
278 4,186,363
284 4,186,364

CLASS 337

206 4,186,365
407 4,186,366

CLASS 338

21 4,186,367
28 4,186,368
274 4,186,369

CLASS 339

41 4,185,881
176 MP 4,185,882

CLASSIFICATION OF PATENTS

CLASS 340

52 F 4,186,376
58 4,186,377
146.1 R 4,186,379
146.3 E 4,186,378
147 SC 4,186,380
152 R 4,186,381
166 R 4,186,382
347 AD 4,186,384
347 DA 4,186,383
365 S 4,186,385
366 R 4,186,386
384 E 4,186,387
556 4,186,388
628 4,186,389
630 4,186,390
645 4,186,391
712 4,186,392
729 4,186,393
764 4,186,394
765 4,186,395

CLASS 343

6.8 R 4,186,396
7.5 4,186,397
100 SA 4,186,398
102 4,186,399
708 4,186,400
715 4,186,401
781 CA 4,186,402
801 4,186,403

CLASS 346

29 4,186,404
140 A 4,186,405
163 4,186,406

CLASS 350

96.14 4,185,884
96.18 4,185,885
96.20 4,185,883
96.21 4,185,886
96.23 4,185,887
96.25 4,185,888
96.32 4,185,889
96.33 4,185,890
167 4,185,891
171 4,185,892
184 4,185,893
338 4,185,894
345 4,185,895

CLASS 351

29 4,185,896
167 4,185,897

CLASS 352

69 4,185,898
72 4,185,899

CLASS 353

26 R 4,185,900
27 R 4,185,901

CLASS 354

5 4,185,902
59 4,185,903
80 4,185,904
141 4,185,905
152 4,185,906

CLASS 355

3 DD 4,185,916
3 R 4,185,907
4,185,908
15 4,185,909
4,185,910
27 4,185,911
28 4,185,912
43 4,185,913
70 4,185,914
77 4,185,915

CLASS 356

141 4,185,919
155 4,185,917
375 4,185,918
406 4,185,920
426 4,185,921

CLASS 357

13 4,186,407
23 4,186,408
38 4,186,409
67 4,186,410

CLASS 358

8 4,186,411
101 4,186,412
146 4,186,413
248 4,186,414
260 4,186,415

CLASS 360

40 4,186,375
107 4,186,416

CLASS 361

15 4,186,417
91 4,186,418
178 4,186,419
194 4,186,420
212 4,186,421
388 4,186,422
433 4,186,423

CLASS 362

13 4,186,424
32 4,186,425
34 4,186,426
66 4,186,427
4,186,428
106 4,186,429
162 4,186,430
223 4,186,431
226 4,186,432
263 4,186,433

CLASS 363

24 4,186,434
37 4,186,435
60 4,186,436
65 4,186,437

CLASS 364

200 4,186,438
405 4,186,439
900 4,186,440

CLASS 365

160 4,186,441

CLASS 366

10 4,185,923
4,185,924
69 4,185,925
101 4,185,926
131 4,185,927

CLASS 367

4 4,186,370
7 4,186,374
109 4,186,371
115 4,186,372
131 4,186,373

CLASS 400

90 4,185,928
124 4,185,929
320 4,185,930
705 4,185,931

CLASS 401

21 4,185,932
104 4,185,933

CLASS 402

80 L 4,185,934

CLASS 403

14 4,185,935
104 4,185,936
316 4,185,937
359 4,185,938

CLASS 404

38 4,185,939
133 4,186,197

CLASS 405

288 4,185,940

CLASS 406

77 4,185,941
85 4,185,942

CLASS 408

46 4,185,943

CLASS 410

64 4,185,564

CLASS 414

621 4,185,944
727 4,185,945

CLASS 417

254 4,185,946
333 4,185,947
477 4,185,948

CLASS 418

203 4,185,949

CLASS 422

64 4,186,187
161 4,186,171
180 4,186,172
250 4,186,173

CLASS 423

54 4,186,174
235 4,186,176
239 4,186,177
265 4,186,178
447.4 4,186,179
469 4,186,180
650 4,186,181

CLASS 424

1 4,186,182
14 4,186,184
19 4,186,185
38 4,186,183
62 4,186,186
70 4,186,188
78 4,186,189
4,186,190
4,186,191
85 4,186,192
89 4,186,193
4,186,194
93 4,186,195
128 4,186,196
177 4,186,198
232 4,186,199
256 4,186,200
258 4,186,201
263 4,186,202
267 4,186,203
269 4,186,204
270 4,186,264
273 R 4,186,205
283 4,186,206
284 4,186,207
324 4,186,208
4,186,209
4,186,210
343 4,186,211
4,186,212

CLASS 425

87 4,185,950
133.5 4,185,951
149 4,185,952
462 4,185,954
542 4,185,955

CLASS 426

2 4,186,213
3 4,186,214
86 4,186,215
480 4,186,216
523 4,186,217
598 4,186,218

CLASS 427

8 4,186,219
4,186,220
45 4,186,221
134 4,186,222
185 4,186,223
221 4,186,224
233 4,186,225
340 4,186,226
388 A 4,186,227

CLASS 428

65 4,186,229
95 4,186,230
158 4,186,231
177 4,186,232
213 4,186,233
283 4,186,234
286 4,186,235
291 4,186,236
323 4,186,237
326 4,186,238
349 4,186,240
399 4,186,239
413 4,186,228
458 4,186,241
528 4,186,242
537 4,186,243
570 4,186,244
635 4,186,245

CLASS 429

60 4,186,246
88 4,186,247
191 4,186,248
4,186,249

CLASS 430

1 4,186,002
97 4,186,003
162 4,186,017
175 4,186,069
213 4,186,014
218 4,186,004
220 4,186,001
228 4,186,005
4,186,013
231 4,186,015
302 4,186,006
353 4,186,009
393 4,186,008
467 4,186,007
505 4,186,011
532 4,186,018
544 4,186,012
557 4,186,019
627 4,186,010

CLASS 431

291 4,185,953

CLASS 432

258 4,185,956

CLASS 433

70 4,185,384
82 4,185,386
173 4,185,383

CLASS 435

11 4,186,251
28 4,186,052
120 4,186,252
180 4,186,053
240 4,186,253

CLASS 521

115 4,186,254
128 4,186,255
155 4,186,256
159 4,186,257

CLASS 525

78 4,186,155
342 4,186,258
461 4,186,154

CLASS 526

74 4,186,259
106 4,186,260

CLASS 528

75 4,186,261
125 4,186,262
128 4,186,263

CLASS 529

78 4,186,156

CLASS 544

146 4,186,136
204 4,186,265
313 4,186,266

CLASS 546

11 4,186,267
21 4,186,268

CLASS 548

186 4,186,129
215 4,186,130
251 4,186,131

CLASS 549

79 4,186,137

CLASS 560

25 4,186,269

CLASS 562

496 4,186,270

CLASS 568

607 4,186,271

CLASSIFICATION OF DESIGNS

D6— 9 254,036
27 254,037
31 254,038
57 254,039
254,040
254,041
69 254,042
164 254,043
173 254,044
198 254,045
254,046
D7— 39 254,047
139 254,048
D8— 98 254,049
349 254,050
499 254,051
D10— 51 254,052
124 254,053
D11— 6 254,054
88 254,055
149 254,056
158 254,057
160 254,058
D12— 58 254,059
96 254,060
137 254,061
158 254,062
181 254,063
205 254,064
D14— 5 254,065
53 254,066
60 254,067
65 254,068
254,069
68 254,070
71 254,071
94 254,072
D15— 52 254,073
138 254,074
D16— 17 254,075
32 254,076
46 254,077
D18— 9 254,078
22 254,079
D21— 87 254,080
254,081
127 254,082
254,083
217 254,084
236 254,093
241 254,085
D22— 25 254,091
D23— 4 254,086
8 254,087
29 254,088
69 254,089
D24— 27 254,090
D25— 77 254,092
D48— 20 K 254,094
D99— 37 254,095

CLASSIFICATION OF PLANTS

P.— 69 4,497
4,498

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

4 : 4,185,778
4,185,894
5 : 4,186,419
6 : 4,185,360
4,185,362
4,185,363
4,185,405
4,185,493
4,185,531
4,185,542
4,185,557
4,185,561
4,185,566
4,185,579
4,185,605
4,185,639
4,185,652
4,185,706
4,185,768
4,185,798
4,185,806
4,185,886
4,185,929
4,185,961
4,186,050
4,186,059
4,186,070
4,186,111
4,186,192
4,186,196
4,186,430
4,186,437
8 : 4,185,815
9 : 4,185,375
4,185,709
4,186,271
4,186,387
01 : 4,185,431
4,185,796
4,186,361
02 : 4,185,811
04 : 4,185,398
4,185,597
4,185,670
4,185,679
4,185,912
4,186,292
4,186,340
05 : 4,185,394
4,185,655
4,185,713
4,186,195
06 : 4,185,331
4,185,333
4,185,342
4,185,371
4,185,373
4,185,381
4,185,407
4,185,413
4,185,430
4,185,460
4,185,466
4,185,472
4,185,479
4,185,480
4,185,492
4,185,496
4,185,497
4,185,501
4,185,507
4,185,538
4,185,558
4,185,560
4,185,586
4,185,592
4,185,611
4,185,628
4,185,632
4,185,650
4,185,651
4,185,664
4,185,691
4,185,694
4,185,695
4,185,696
4,185,715
4,185,720
4,185,730
4,185,731
4,185,744
4,185,797
4,185,808
4,185,819
4,185,824
4,185,833
4,185,837
4,185,841
4,185,847
4,185,849
4,185,862
4,185,864
4,185,882
4,185,895
4,185,899
4,185,913
4,185,933
4,185,950
4,185,955
4,186,023
4,186,025
4,186,048
4,186,081
4,186,099
4,186,130
4,186,184
4,186,185
4,186,187
4,186,188
4,186,216
4,186,283
4,186,295
4,186,302
4,186,304
4,186,313
4,186,347
4,186,354
4,186,373
4,186,379
4,186,394
08 : 4,185,372
4,185,622
4,185,638
4,185,692
4,185,871
4,186,123
4,186,171
4,186,236
4,186,306
09 : 4,185,338
4,185,382
4,185,465
4,185,509
4,185,757
4,185,766
4,185,825
4,185,976
4,186,083
4,186,100
4,186,110
4,186,215
4,186,284
4,186,316
10 : 4,186,381
4,185,490
4,185,588
4,186,107
11 : 4,186,335
4,185,556
12 : 4,185,332
4,185,348
4,185,448
4,185,457
4,185,458
4,185,464
4,185,535
4,185,554
4,185,602
4,185,804
4,185,821
4,185,827
4,185,832
4,185,853
4,185,897
4,185,904
4,186,030
4,186,031
4,186,062
4,186,246
4,186,296
4,186,311
4,186,349
4,186,384
4,186,401
13 : 4,185,401
4,185,582
4,186,224
16 : 4,185,327
4,185,616
17 : 4,185,350
4,185,374
4,185,391
4,185,400
4,185,402
4,185,422
4,185,424
4,185,435
4,185,483
4,185,487
4,185,488
4,185,494
4,185,512
4,185,521
4,185,543
4,185,548
4,185,576
4,185,681
4,185,712
4,185,734
4,185,758
4,185,759
4,185,767
4,185,781
4,185,830
4,185,838
4,185,870
4,185,900
4,185,928
4,185,978
4,186,020
4,186,063
4,186,069
4,186,082
4,186,165
4,186,225
4,186,263
4,186,275
4,186,309
4,186,318
4,186,331
4,186,363
4,186,365
4,186,366
4,186,414
18 : 4,185,530
4,185,563
4,185,587
4,185,590
4,185,612
4,185,653
4,185,723
4,185,729
4,185,924
4,185,934
4,186,131
4,186,221
4,186,247
4,186,251
4,186,319
4,186,369
4,186,388
19 : 4,185,516
4,185,589
4,185,685
4,185,698
4,185,700
4,186,213
4,186,239
20 : 4,185,489
4,185,593
21 : 4,185,352
4,185,814
4,186,055
4,186,077
4,186,162
4,186,223
4,186,287
22 : 4,186,147
24 : 4,185,550
4,185,551
4,185,555
4,185,629
4,185,777
4,185,859
4,185,964
4,186,088
4,186,183
4,186,214
4,186,429
4,186,434
4,186,440
25 : 4,185,384
4,185,462
4,185,627
4,185,634
4,185,641
4,185,688
4,185,711
4,185,822
4,185,884
4,185,888
4,185,896
4,185,903
4,185,905
4,185,937
4,186,001
4,186,005
4,186,013
4,186,015
4,186,026
4,186,038
4,186,045
4,186,046
4,186,190
4,186,273
4,186,274
4,186,308
4,186,332
4,186,338
4,186,351
4,186,377
4,186,386
4,186,390
4,186,424
26 : 4,185,337
4,185,340
4,185,368
4,185,370

4,185,514
4,185,515
4,185,594
4,185,607
4,185,615
4,185,661
4,185,668
4,185,717
4,185,726
4,185,728
4,185,735
4,185,751
4,185,802
4,185,844
4,185,855
4,185,867
4,185,868
4,185,932
4,185,935
4,186,068
4,186,096
4,186,097
4,186,102
4,186,117
4,186,127
4,186,153
4,186,156
4,186,191
4,186,208
4,186,233
4,186,250
4,186,270
4,186,279
4,186,286
4,186,355
4,186,380
27 : 4,185,336
4,185,389
4,185,408
4,185,416
4,185,427
4,185,523
4,185,565
4,185,581
4,185,654
4,185,699
4,185,762
4,185,765
4,185,782
4,185,807
4,185,809
4,185,829
4,185,938
4,185,996
4,186,132
4,186,201
4,186,315
29 : 4,185,359
4,185,426
4,185,447
4,185,564
4,185,647
4,185,989
4,185,990
4,186,314
4,186,317
4,186,425
30 : 4,185,403
4,185,441
33 : 4,185,722
4,186,261
4,186,413
34 : 4,185,392
4,185,396
4,185,429
4,185,443
4,185,474
4,185,485
4,185,526
4,185,528
4,185,534
4,185,571
4,185,572
4,185,574
4,185,575
4,185,585
4,185,618
4,185,625
4,185,631
4,185,637
4,185,673
4,185,732
4,185,740
4,185,753
4,185,840
4,185,915
4,185,942
4,185,957
4,185,985
4,186,032
4,186,066
4,186,080
4,186,085
4,186,113
4,186,138
4,186,149
4,186,150
4,186,163
4,186,164
4,186,189
4,186,199
4,186,205
4,186,217
4,186,245
4,186,256
4,186,268
4,186,324
4,186,327
4,186,391
4,186,392
4,186,410
4,186,420
4,186,422
35 : 4,185,335
36 : 4,185,347
4,185,349
4,185,369
4,185,414
4,185,425
4,185,455
4,185,473
4,185,482
4,185,549
4,185,591
4,185,601
4,185,608
4,185,619
4,185,636
4,185,674
4,185,687
4,185,743
4,185,754
4,185,779
4,185,816
4,185,826
4,185,828
4,185,848
4,185,861
4,185,891
4,185,906
4,185,908
4,185,916
4,185,917
4,185,918
4,185,965
4,185,984
4,185,999
4,186,003
4,186,009
4,186,021
4,186,058
4,186,060
4,186,093
4,186,103
4,186,161
4,186,182
4,186,299
4,186,321
4,186,339
4,186,359
4,186,389
4,186,393
4,186,399
4,186,400
4,186,403
4,186,417
37 : 4,185,334
4,185,364
4,185,393
4,185,421
4,185,610
4,185,671
4,185,764
4,185,846
4,185,459
4,185,869
4,186,043
4,186,265
4,186,288
4,186,433
39 : 4,185,328
4,185,343
4,185,379
4,185,461
4,185,468
4,185,577
4,185,584
4,185,613
4,185,646
4,185,721
4,185,724
4,185,812
4,185,839
4,185,866
4,185,919
4,185,943
4,185,945
4,185,975
4,185,980
4,186,033
4,186,035
4,186,042
4,186,071
4,186,115
4,186,139
4,186,157
4,186,230
4,186,231
4,186,248
4,186,249
4,186,259
4,186,278
4,186,293
40 : 4,185,689
4,185,760
4,185,875
4,186,047
4,186,061
4,186,175
4,186,178
4,186,260
4,186,372
4,186,374
41 : 4,185,361
4,185,380
4,185,444
4,185,545
4,185,617
4,185,707
4,185,860
4,185,863
4,186,160
4,186,310
4,186,368
42 : 4,185,351
4,185,355
4,185,467
4,185,484
4,185,519
4,185,539
4,185,553
4,185,657
4,185,658
4,185,660
4,185,716
4,185,746
4,185,770
4,185,786
4,185,857
4,185,926
4,185,948
4,185,974
4,185,983
4,185,986
4,185,995
4,185,998
4,186,054
4,186,084
4,186,091
4,186,124
4,186,146
4,186,193
4,186,219
4,186,226
4,186,303
4,186,312
4,186,337
4,186,405
4,186,409
4,186,426
4,186,431
43 : 4,185,423
44 : 4,185,345
4,185,471
4,185,850
4,186,064
4,186,370
4,186,397
45 : 4,185,433
4,185,451
4,185,787
4,185,813
4,186,209
47 : 4,185,569
4,185,663
4,185,667
4,185,741
4,185,772
48 : 4,185,330
4,185,511
4,185,525
4,185,541
4,185,552
4,185,621
4,185,690
4,185,704
4,185,719
4,185,775
4,185,805
4,185,818
4,185,856
4,185,865
4,185,872
4,185,946
4,185,970
4,186,000
4,186,036
4,186,079
4,186,086
4,186,166
4,186,212
4,186,244
4,186,254
4,186,255
4,186,258
4,186,320
4,186,325
4,186,342
4,186,352
49 : 4,185,774
4,185,817
4,185,979
51 : Re.30,198
4,185,417
4,185,947
4,186,040
4,186,408
53 : 4,185,415
4,185,437
4,185,520
4,185,559
4,185,578
4,185,799
4,185,858
4,185,944
4,186,044
4,186,242
54 : 4,185,982
4,186,065
4,186,121
55 : 4,185,365
4,185,376
4,185,478
4,185,502
4,185,508
4,185,630
4,185,697
4,185,742
4,185,769
4,185,927
4,186,072
4,186,098
4,186,108
4,186,291
56 : 4,185,609
4,185,702
4,185,705

DESIGN PATENTS

6 : 254,078
9 : 254,047
254,048
06 : 254,037
254,059
254,060
254,063
254,064
254,079
254,080
254,081
254,085
254,094
09 : 254,051
254,086
254,090
12 : 254,036
254,054
17 : 254,067
254,075
18 : 254,074
23 : 254,058
25 : 254,062
254,068
254,069
26 : 254,066
254,084
254,093
27 : 254,049
254,052
254,082
254,083
34 : 254,043
254,076
37 : 254,039
254,040
254,041
254,045
254,046
39 : 254,056
254,061
42 : 254,095
44 : 254,055
47 : 254,053
53 : 254,044
254,050
254,089

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